

Service Manual

FLASHES

**AUTO
ELECTRO FLASH
360PX**

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8810

**AUTO
ELECTROFLASH
132PX**

.....

8814

**AUTO ELECTRO FLASH
280PX**

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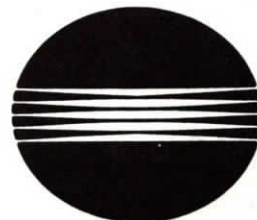
8808

**AUTO
ELECTROFLASH
200X**

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8668

ENGLISH



MINOLTA

MINOLTA AUTO ELECTROFLASH 280PX (8808)

General Description

The 280PX is a series control system, clip-on type automatic electronic flash with the guide number 28 (ASA/ISO 100-m) for exclusive with the X-700. Flash firing is controlled by means of auto flash control through direct light metering.

Type

- Series control system, auto electroflash through X-700 direct light measurement (provided with synchro auto control contact and direct auto control contact)
- Clip-on
- Direct contact (hot shoe) system

Interlocking Function with the X-700

The 280PX flashes automatically due to direct light metering when combined with the X-700 (interlocked with the program mode and aperture-priority mode). A flash-ready signal blinks in the finder. When the shutter is released, a synchronized speed is automatically obtained. When a optimum exposure has been obtained, the shutter speed is indicated in the finder after shooting.

Guide Number (ASA/ISO-m)

Hi-Lo Selectable

Wide Panel Light Quantity Selection Control ASA/ISO	None		In Use	
	Hi	Lo	Hi	Lo
400	56	14	40	10
200	40	10	28	7
100	28	7	20	5
50	20	5	14	3.5
25	14	3.5	10	2.5

Metering Range for Auto Flashing (On-camera ASA/ISO 100)

- 0.7 to 7m (F1.4 lens) for program auto flash (P mode).
- At aperture-priority auto flash (A mode):

Wide Panel Light Quantity Selection Control F-number	None		In Use	
	Hi	Lo	Hi	Lo
1.4	0.7~20	0.7~5	0.7~14	0.7~3.5
2	0.7~14	0.7~3.5	0.7~10	0.7~2.5
2.8	0.7~10	0.7~2.5	0.7~7	0.7~1.8
4	0.7~7	0.7~1.8	0.7~5	0.7~1.3
5.6	0.7~5	0.7~1.3	0.7~3.5	0.7~0.9
8	0.7~3.5	0.7~0.9	0.7~2.5	
11	0.7~2.5		0.7~1.8	
16	0.7~1.8		0.7~1.3	

Illuminating Angle and Applicable Lens

Wide Panel	Illuminating Angle		Lens Applicable (35mm Camera)
	Up/Down	Right/Left	
None	45°	60°	35mm or greater
Used	53°	70°	28mm or greater



Flash Time

Auto: Approx. 1/50000 to 1/1000sec.
Manual: Hi Approx. 1/1000sec.
Lo Approx. 1/10000sec.

Firing Frequency and Interval

(according to MINOLTA test conditions)

Light Quantity Selection Control Battery used	Firing Frequency (times)		Firing Interval (sec.)	
	Hi	Lo	Hi	Lo
Manganese Cell	70	1000	9	1
Alkaline Cell	200	2000	6	0.5
Ni-Cd Cell	100	600	3.5	0.3

The above figures very depending on the kind of battery (brand), production date, lapse of time after production and temperature of operating surroundings.

Quality of Light

Compatible with a daylight type color film.

Batteries used: 4 batteries either of the

Manganese dry battery (JIS, SUM-3)
Alkaline dry battery (JIS, LR-6)
Ni-Cd strage battery (JIS, KA-AA)
types.

Indication

Monitor Lamp

lights up when charging is completed.

The flash will not fire when this lamp does not light up Monitor lamp goes off with the power switch OFF. Monitor lamp with a window, an independent flash (red) button.

Confirmation of Flash-ready Condition

With the X-700 installed, touching or pressing the shutter release button lights the monitor lamp, and simultaneously indicates a flash-ready display in the view finder. (LED blinks beside "60" indication)

Optimum Exposure Indication

• When the 280PX is combined with the X-700, the LED beside the "60" in the view finder flashes approximately one second earlier after shooting if a optimum exposure has been obtained.

• When the 280PX is used in combination with the X-700, the FDC lamp lights up for about 2 seconds immediately after shooting if a optimum exposure has been obtained.

Size: 70(W)×102(H)×60(D)mm

Weight: 200g (not including batteries)

Date of Sale: October, 1981 (in Japan)

SERVICE MANUAL SUPPLEMENTARY INFORMATION

Model AUTO ELECTROFLASH 45FPX

Code No. 8808-200

■ 8808-200 Parts List

- This product (8808-200) goes on sale for the U.S. department stores with only its name plate changed from that of the Auto Electroflash 280PX (8808).

- Repair parts

The 8808-200 parts remain the same as those of the 8808 (280PX), except for the name plate that is exclusively used for the 8808-200.

Before marketing the product, 200 parts for exclusive use with 8808-200 will be distributed to the service station in New Jersey. For service use in any area other than NJ, place orders with the NJ service station for the required number of 8808-200 parts.

(We will accept any order for this part only through the NJ service station.)

- Parts List

Part No. 8808-2020-01

Part Name: Name plate

MINOLTA
AUTO 45FPX

I N D E X

Part No.	Page	Part No.	Page	Part No.	Page
8808-0102-----	2	8808-1022-----	2	ELECTRO PARTS	
8808-0103-----	1	8808-1023-----	2	IC	
8808-0106-----	2	8668-1024-----	2	9360-0180-01-----	4
8808-0111-----	3	8808-1024-----	1		
8808-0121-----	3	8808-1025-----	1	Photo diode	
8808-0131-----	4	8808-1026-----	1	9353-2181-01-----	3
8808-0132-----	2	8808-1027-----	3		
		8808-1028-----	3	L.E.D	
8808-1001-----	2			9353-2083-01-----	4
8808-1004-----	1	8808-1030-----	1	9353-2184-01-----	4
8808-1005-----	2	8808-1032-----	2		
		8807-1033-----	2	Diode	
8808-1008-----	1	8808-1034-----	1	9361-2082-11-----	3,4
8808-1009-----	1,2	8808-1036-----	2	9361-2083-01-----	3
8808-1010-----	3	8808-1037-----	2	9361-2085-01-----	3
8808-1011-----	2	8808-1038-----	2	9361-2180-01-----	3
8808-1012-----	1			9361-4181-31-----	4
8808-1013-----	1	Screw			
8808-1014-----	1	9611-2035-07-----	1	Photo transistor	
8808-1016-----	1	9611-2050-07-----	1	9360-1080-31-----	3
8808-1017-----	1	9691-2080-07-----	2		
8808-1018-----	3	9693-2060-01-----	1	Transistor	
8808-1019-----	3			9362-1080-01-----	3,4
8808-1020-----	2	Xe. tube		9363-1080-21-----	3
8808-1021-----	2	9351-6184-31-----	2		

I N D E X

Part No.	Page	Part No.	Page	Part No.	Page
9363-1181-01-----3		9422-2216-81-----4		9535-2245-80-----3	
9363-2080-31-----3		9422-2416-81-----4			
		9422-2736-81-----4		9544-1033-80-----4	
Thyristor		9422-3326-81-----4		9545-6833-80-----4	
9365-1081-21-----3		9422-3336-81-----4		9545-6834-80-----3	
9365-1081-31-----3		9422-4716-81-----4		9548-3354-80-----3	
9365-1181-01-----3		9422-5616-81-----4		9548-4735-80-----3	
9365-1181-02-----3				9548-4735-81-----3	
		9423-5644-81-----4		9548-6835-80-----3	
Fixed resistor		9423-6846-81-----4		9563-5035-80-----3	
9413-1017-80-----3		9423-9146-81-----4		9564-1014-80-----4	
9413-1027-80-----3				9564-1035-80-----3	
9413-1537-80-----3		9435-1036-80-----3		9564-3325-80-----3,4	
9413-1557-80-----3		9435-8226-80-----3		9564-4725-80-----4	
9413-2207-80-----3		9436-1536-80-----3		9564-6825-80-----4	
9413-2227-80-----3					
9413-3307-80-----3		Variable resistor		9565-1024-80-----4	
9413-4707-80-----3		9462-2048-80-----4		9565-3325-80-----3	
		9462-5028-80-----4			
9422-1016-81-----4		Condenser		Transistor	
9422-1026-81-----4		9512-1075-80-----3		9324-1181-41-----3	
9422-1036-81-----3,4		9512-1075-81-----4		9324-2081-01-----3	
9422-1046-81-----4		9512-4765-80-----4		Inductor	
9422-1526-81-----4		9518-6570-80-----1		9320-0080-01-----3	
9422-1536-81-----4		9534-1055-80-----4		9320-0081-01-----3	

I N D E X

Part No. Page

9320-0180-01-----4

Switch

9333-2081-51-----4

Lead wire

9381-1910-01----3,4,5

9381-1912-01-----3,5

9381-1913-01-----3,5

9381-1914-01-----3,5

9381-1916-01-----3,5

9381-1920-01-----4,5

9381-1921-01-----3,5

9381-1922-01-----3,5

9381-1923-01-----3,5

9381-1924-01----3,4,5

9381-1925-01-----3,5

9381-1926-01-----3,5

9381-1927-01----3,4,5

9381-1928-01----3,4,5

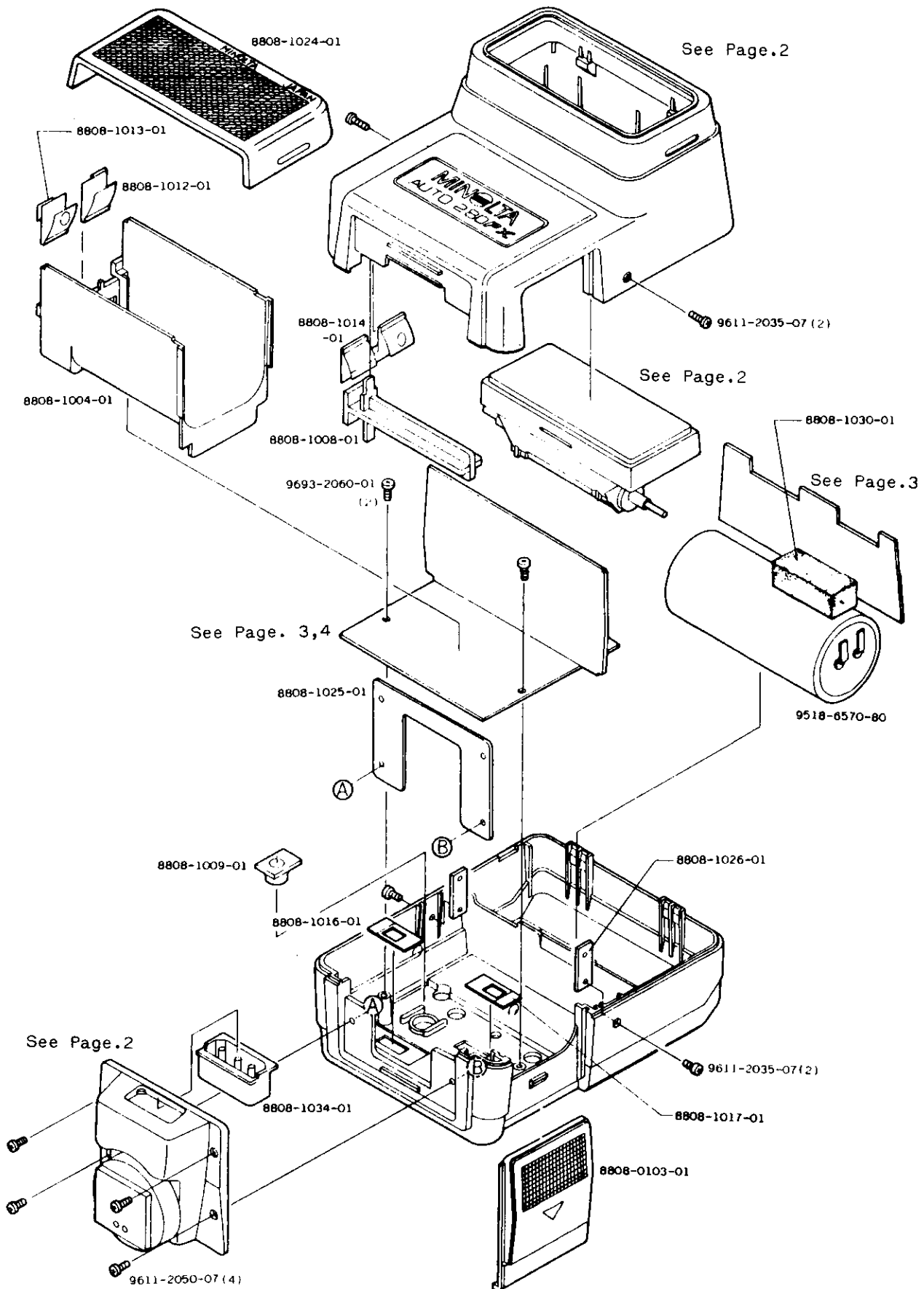
9381-1929-01----3,4,5

Tube

9384-2905-01-----3,4

AUTO ELECTRO FLASH 280PX

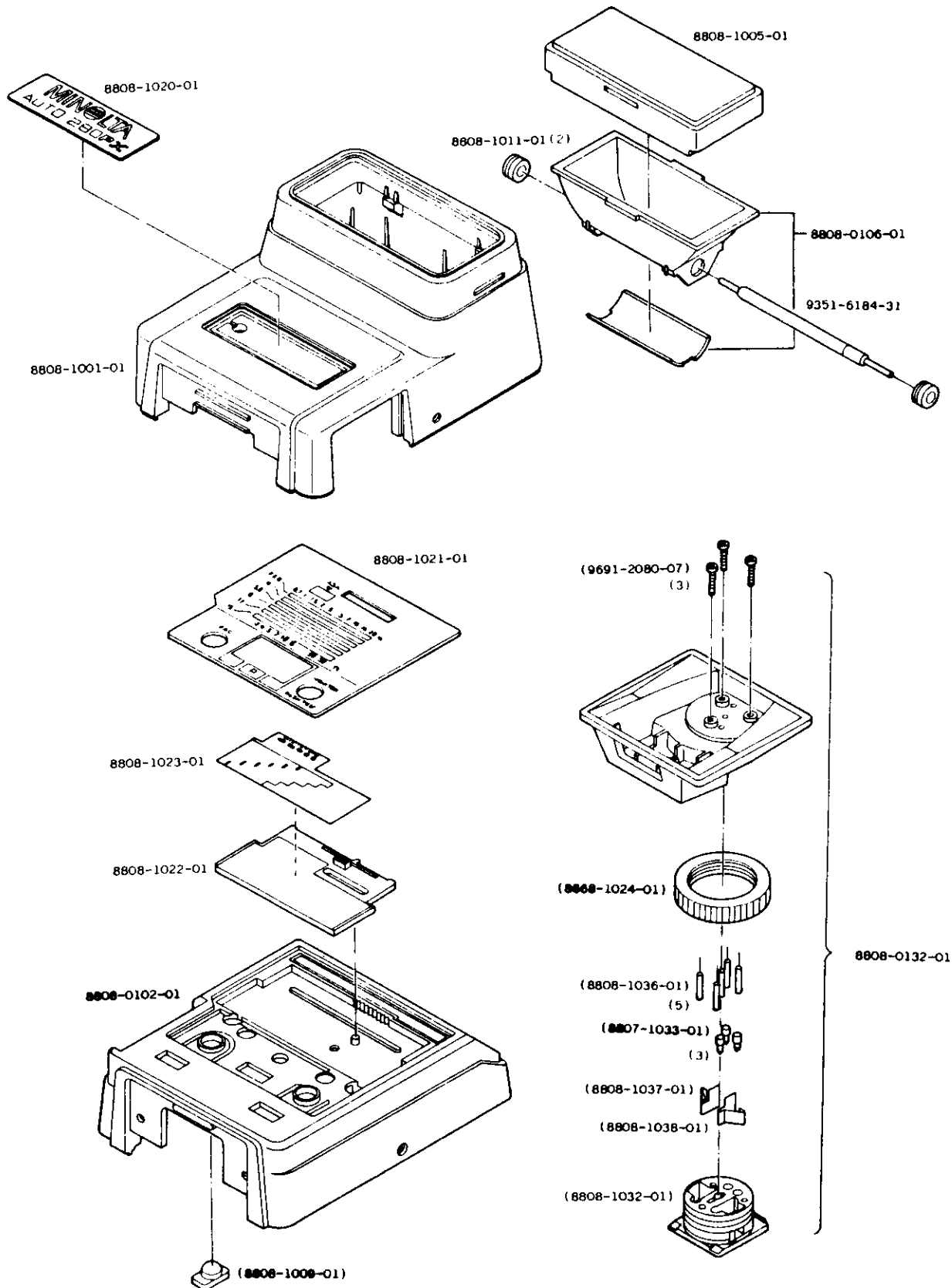
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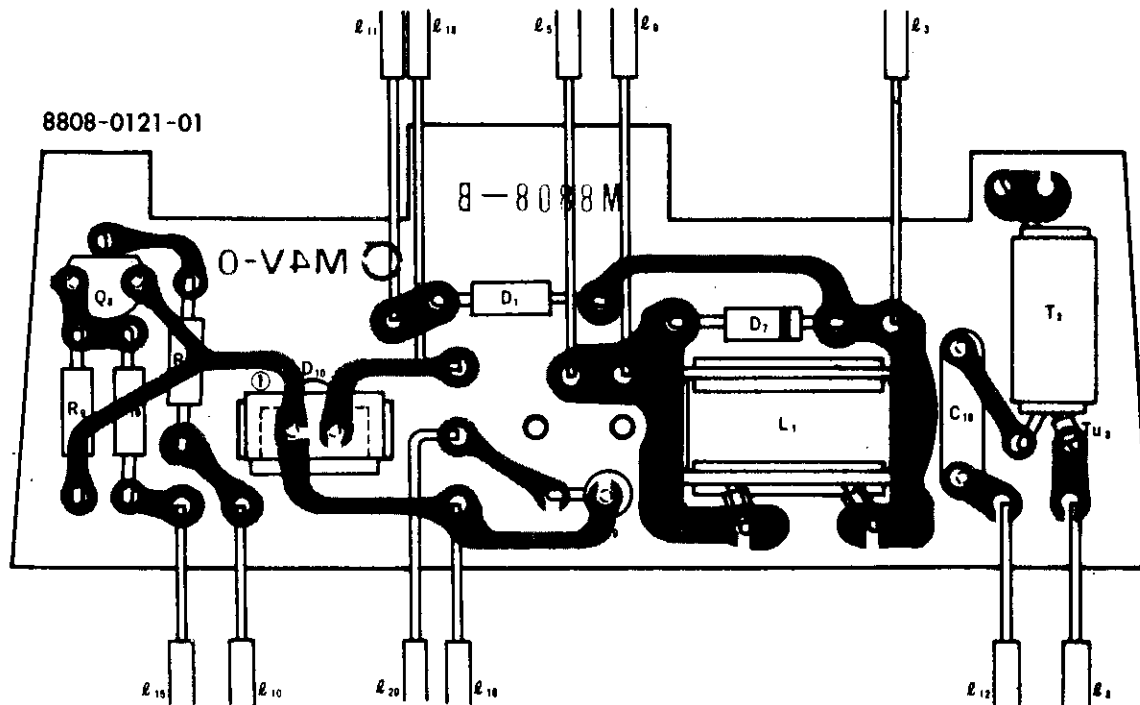
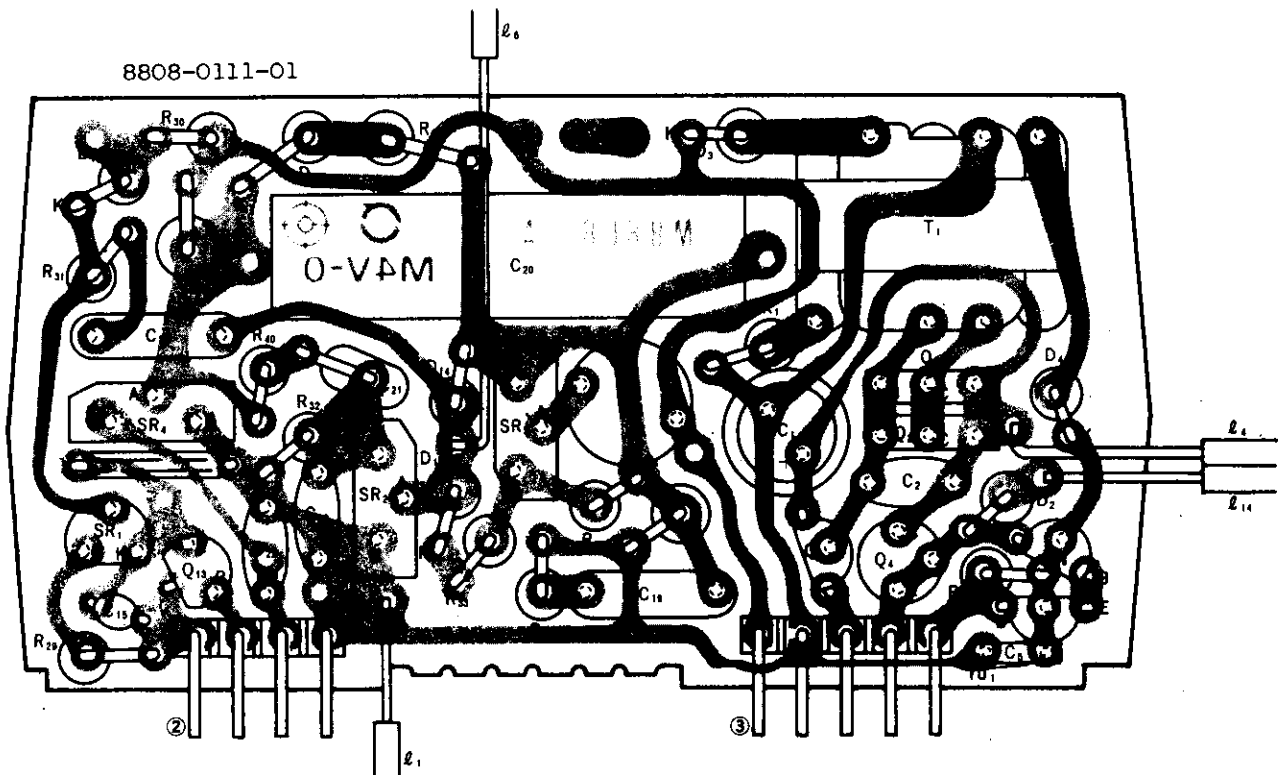
Part No.	Part Name		Qty
8808-0103-01	Battery chamber cover set	電池蓋セット	1
8808-1004-01	Battery chamber	電池室モールド	1
8808-1008-01	Battery separator	電池セパレータ	1
8808-1009-01	Test button	単発釦	1
8808-1012-01	Battery ⊕ contact	電池プラス接片	1
8808-1013-01	Battery ⊖ contact	電池マイナス接片	1
8808-1014-01	Battery contact	電池共通接片	1
8808-1016-01	Power switch plate	スイッチ銘板	1
8808-1017-01	Hi/Lo changeover switch plate	スイッチ銘板-B	1
8808-1024-01	28mm wide panel	28mm ワイドパネル	1
8808-1025-01	Shoe set plate	シュー止め板	1
8808-1026-01	Nut	横止めナット	2
8808-1030-01	Sponge	スポンジ	1
8808-1034-01	Connector	コネクター	1
9611-2035-07	Phillips type screw	十字穴付なべ頭小ねじ	4
9611-2050-07	Phillips type screw	十字穴付なべ頭小ねじ	4
9693-2060-01	Phillips type tapping screw	十字穴付タッピングねじ	2
9518-6570-80	Main condenser (C10:650μF350V)	メインコンデンサー(C10)	1

AUTO ELECTRO FLASH 280PX

CODE No. 8808



Part No.	Part Name		Qty
8808-0102-01	Rear cover set	本体モールドBセット	1
(8808-1009-01)	Test button	単発釦	1
8808-0106-01	Reflector set	反射傘セット	1
8808-0132-01	Hot shoe set	シューセット	1
(8668-1024-01)	Shoe nut	シューナット	1
(8808-1032-01)	Shoe case	シューケース B	1
(8807-1033-01)	Sync. contact	シュー接点	3
(8808-1036-01)	Contact spring	シュー接点ばね	5
(8808-1037-01)	Shoe contact	シュー (一) 接片	1
(8808-1038-01)	Shoe contact-B	シュー (一) 接片B	1
(9691-2080-07)	Phillips type tapping screw	十字穴付タッピングねじ	3
8808-1001-01	Front cover	本体モールドA	1
8808-1005-01	Panel	パネル	1
8808-1011-01	Xe. bushing	Xe ブッシング	2
8808-1020-01	Name plate	前銘板	1
8808-1021-01	Indication plate	表示室	1
8808-1022-01	Calculation plate	露出計算板	1
8808-1023-01	Film speed plate	露出銘板	1
9351-6184-31	Xe. tube	Xe. チューブ	1

AUTO ELECTRO FLASH 280PX**CODE No. 8808**

Assy. Part No. 8808-0111-01 Assy. Part Name プリント基板 Aセット
P.C. board-A set

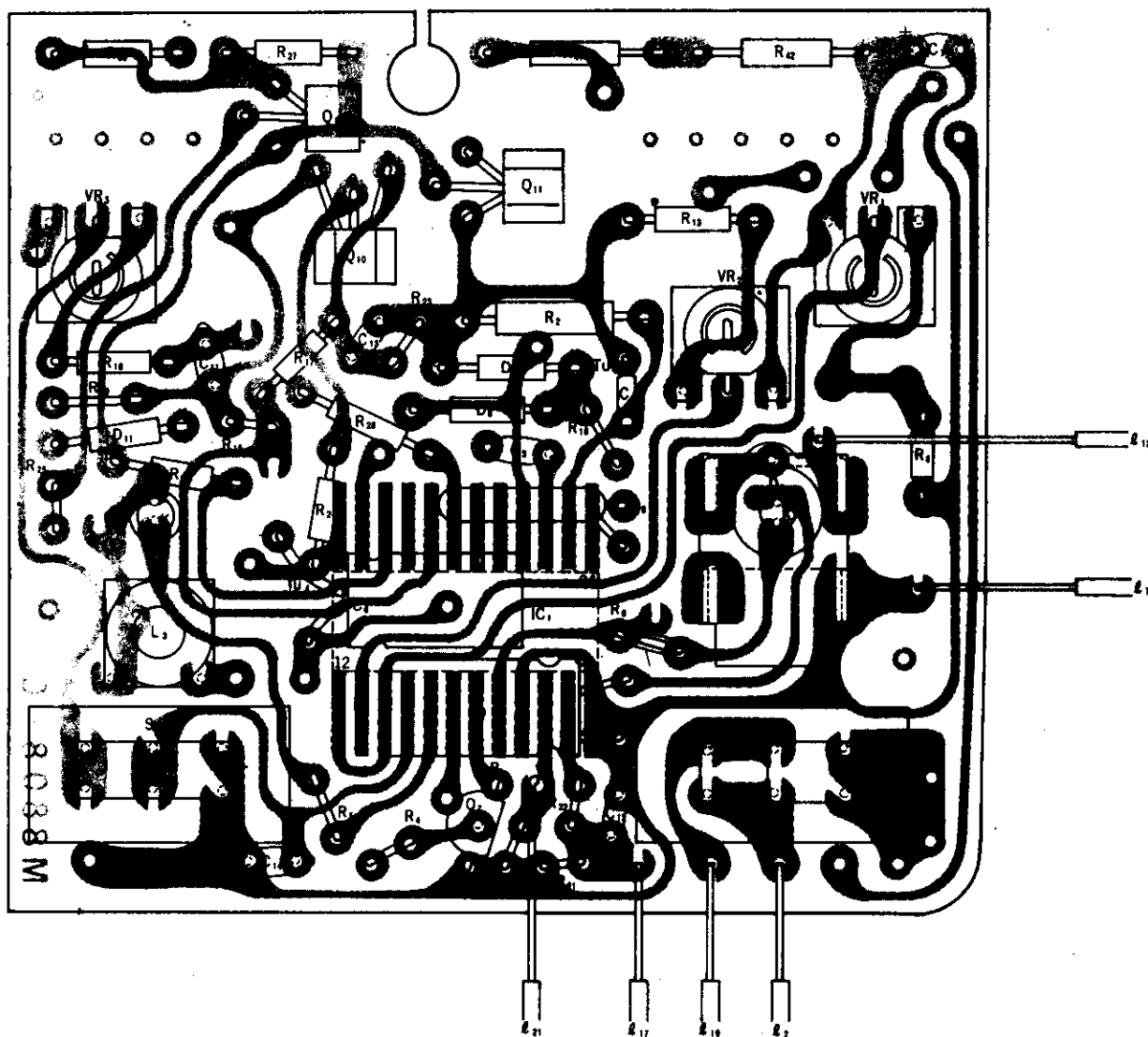
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D15 D14 D13 D12 D2	9361-2082-11		Diode	10D8	5
D3	9361-2083-01			SIR150	1
D4	9361-2180-01			S52950D	1
Q2 Q1	9363-1181-01		Transistor	2SA1120	2
Q3	9363-1080-21			2SA1115	1
Q4	9363-2080-31			2SB324	1
Q13 Q6 Q5	9362-1080-01			2SC2603	3
SR1	9365-1081-21		Thyristor	CRO2AM-8	1
SR2	9365-1181-01			CR3 AMZ-8	1
SR3	9365-1181-02			CR3 EM-8	1
SR4	9365-1081-31			CR3 CM-8	1
R1	9413-2227-80		Fixed resistor	1/4W 2.2K Ω	1
R3	9413-1537-80			1/4W 15K Ω	1
R36 R29	9413-1017-80			1/4W 100 Ω	2
R30	9413-1557-80			1/4W 1.5M Ω	1
R31	9413-3307-80			1/4W 33 Ω	1
R33 R32	9413-2207-80			1/4W 22 Ω	2
R34	9413-4707-80			1/4W 47 Ω	1
R35	9435-8226-80			1W 8.2K Ω	1
R37	9435-1036-80			1W 10K Ω	1
R39	9436-1536-80			3W 15K Ω	1
R40	9413-1027-80			1/4W 1K Ω	1
C1	9512-1075-80		Condenser	100 μ F10V SP type	1
C2	9564-1035-80			0.01 μ F25V	1
C5	9545-6834-80			6800PF50V	1
C15	9535-2245-80			0.22 μ F35V	1
C19 C17	9548-6835-80			0.068 μ F M35IID	2
C18	9563-5035-80			0.05 μ F12V	1
C20	9548-3354-80			3.3 μ F K401	1
C21	9548-4735-80			0.047 μ F M35I-T	1
C22	9565-3325-80			3300PF50V	1
T1	9324-1181-41		Transformer	#1608	1
L2	9320-0081-01		Inductor	L2-0535	1
ℓ 1	9381-1910-01		Lead wire	Black UL1007AWG26 ℓ =60	1
ℓ 4	9381-1912-01			Red UL1007AWG26 ℓ =60	1
ℓ 6	9381-1916-01			Blue UL1007AWG26 ℓ =100	1
ℓ 14	9381-1925-01			Green UL1095AWG28 ℓ =130	1
Tu1	9384-2905-01		Tube	AWG18 ℓ =10	1
②	8808-1027-01		Connector-A		1
③	8808-1028-01		Connector-B		1

Assy. Part No. 8808-0121-01 Assy. Part Name フレキシブル基板 Bセット
P.C. board-B set

Symbol	Part No.	Com	Part Name	Typ.	Qty.
D1	9361-2082-11		Diode	10D8	1
D7	9361-2085-01			SRIFM-12K	1
D10	9353-2181-01		Photo diode	LN-25CPW	1
Q8	9363-1080-21		Transistor	2SA1115	1
Q9	9360-1080-31		Photo transistor	PN-126S	1
R11 R10 R9	9422-1036-81		Fixed resistor	1/8W 10K Ω	3
C16	9548-4735-81		Condenser	0.047 μ FM35II-D	1
T2	9324-2081-01		Trigger coil	NC850	1
L1	9320-0080-01		Inductor	272L1	1
ℓ 3	9381-1913-01		Lead wire	Orange UL1007AWG26 ℓ =70	1
ℓ 5	9381-1914-01			Yellow UL1007AWG26 ℓ =60	1
ℓ 8	9381-1921-01			Brown UL1095AWG28 ℓ =70	1
ℓ 9	9381-1922-01			Red UL1095AWG28 ℓ =60	1
ℓ 10	9381-1923-01			Orange UL1095AWG28 ℓ =80	1
ℓ 11	9381-1923-01			Orange UL1095AWG28 ℓ =170	1
ℓ 12	9381-1024-01			Yellow UL1095AWG28 ℓ =70	1
ℓ 15	9381-1926-01			Blue UL1095AWG28 ℓ =100	1
ℓ 16	9381-1927-01			Purple UL1095AWG28 ℓ =120	1
ℓ 18	9381-1928-01			Grey UL1095AWG28 ℓ =110	1
ℓ 20	9381-1929-01			White UL1095AWG28 ℓ =110	1
Tu3	9384-2905-01		Tube	AWG18 ℓ =3	2
(1)	8808-1010-01		Photo diode holder		1

AUTO ELECTRO FLASH 280PX**CODE No. 8808**

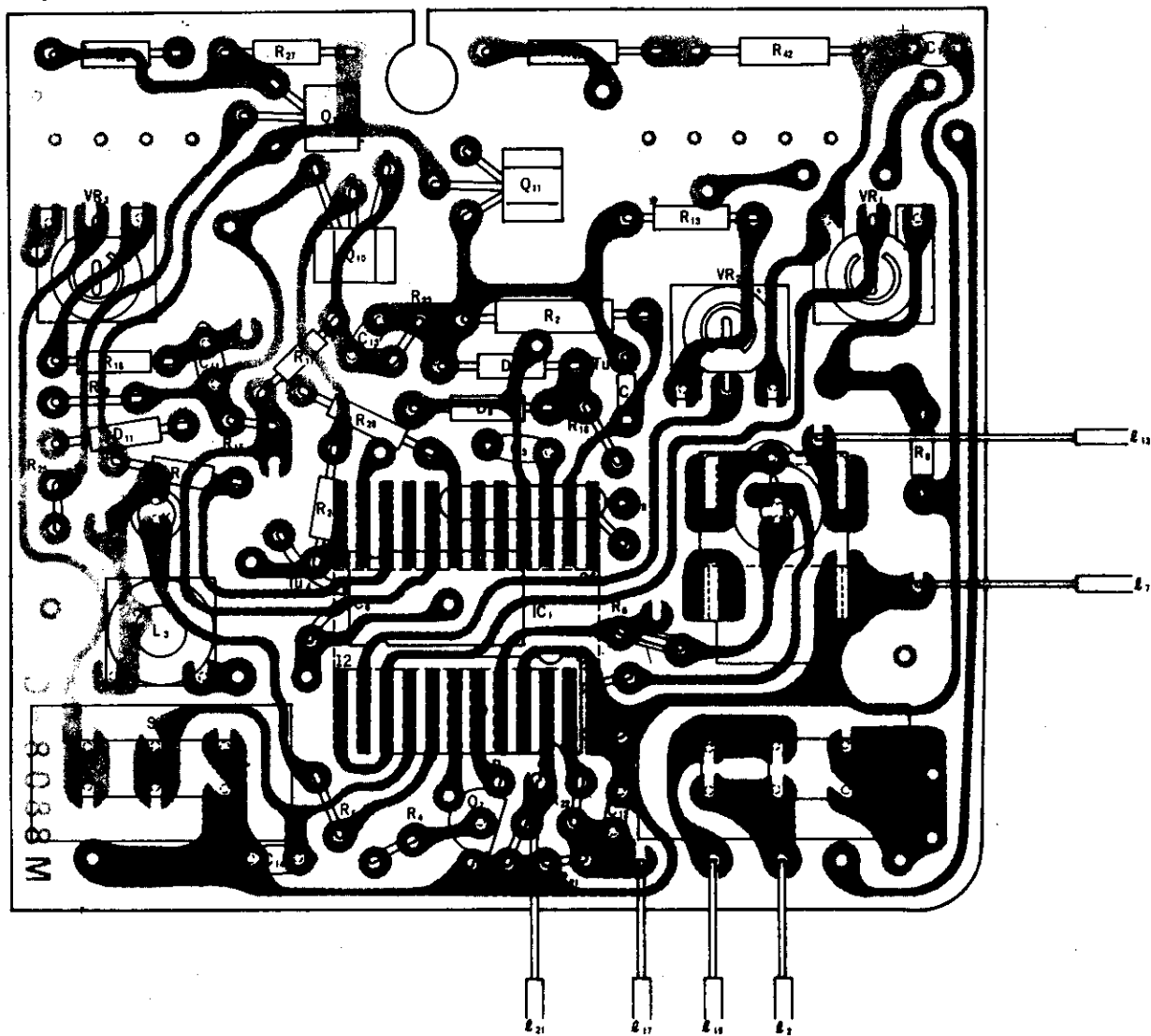
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AUTO ELECTRO FLASH 280PX

CODE No. 8808

8808-0131-01



Assy. Part No. 8808-0111-01 Assy. Part Name プリント基板 Aセット
P.C. board-A set

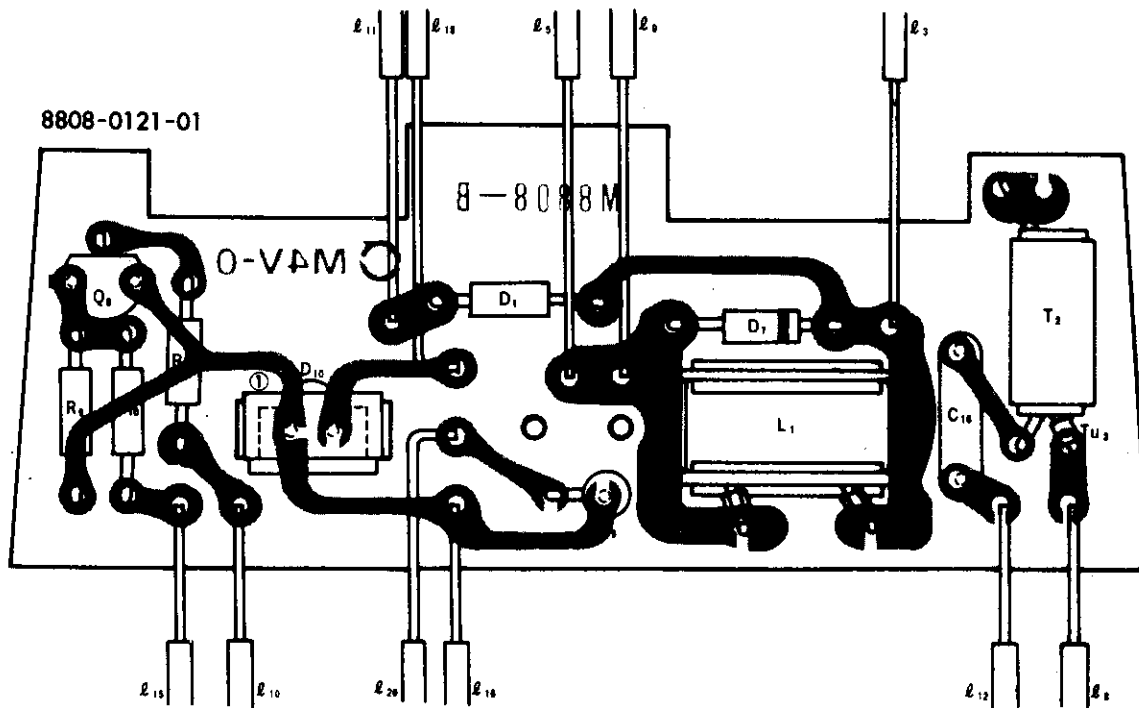
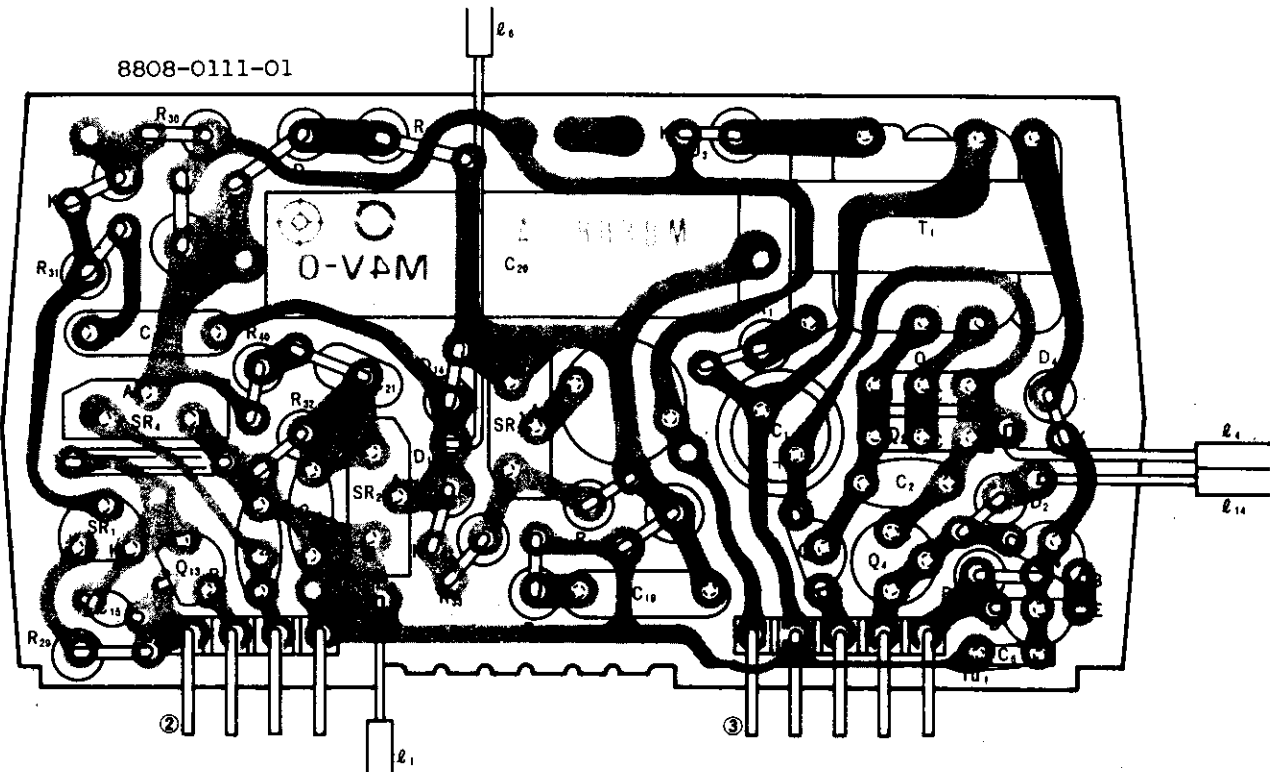
Symbol	Part No.	Com	Part Name	Typ.	Qty.
D15 D14 D13 D12 D2	9361-2082-11		Diode	10D8	5
D3	9361-2083-01			SIR150	1
D4	9361-2180-01			S52950D	1
Q2 Q1	9363-1181-01		Transistor	2SA1120	2
Q3	9363-1080-21			2SA1115	1
Q4	9363-2080-31			2SB324	1
Q13 Q6 Q5	9362-1080-01			2SC2603	3
SR1	9365-1081-21		Thyristor	CRO2AM-8	1
SR2	9365-1181-01			CR3 AMZ-8	1
SR3	9365-1181-02			CR3 EM-8	1
SR4	9365-1081-31			CR3 CM-8	1
R1	9413-2227-80		Fixed resistor	1/4W 2.2K Ω	1
R3	9413-1537-80			1/4W 15K Ω	1
R36 R29	9413-1017-80			1/4W 100 Ω	2
R30	9413-1557-80			1/4W 1.5M Ω	1
R31	9413-3307-80			1/4W 33 Ω	1
R33 R32	9413-2207-80			1/4W 22 Ω	2
R34	9413-4707-80			1/4W 47 Ω	1
R35	9435-8226-80			1W 8.2K Ω	1
R37	9435-1036-80			1W 10K Ω	1
R39	9436-1536-80			3W 15K Ω	1
R40	9413-1027-80			1/4W 1K Ω	1
C1	9512-1075-80		Condenser	100 μ F10V SP type	1
C2	9564-1035-80			0.01 μ F25V	1
C5	9545-6834-80			6800PF50V	1
C15	9535-2245-80			0.22 μ F35V	1
C19 C17	9548-6835-80			0.068 μ F M35IID	2
C18	9563-5035-80			0.05 μ F12V	1
C20	9548-3354-80			3.3 μ F K401	1
C21	9548-4735-80			0.047 μ F M35I-T	1
C22	9565-3325-80			3300PF50V	1
T1	9324-1181-41		Transformer	#1608	1
L2	9320-0081-01		Inductor	L2-0535	1
ℓ 1	9381-1910-01		Lead wire	Black UL1007AWG26 ℓ =60	1
ℓ 4	9381-1912-01			Red UL1007AWG26 ℓ =60	1
ℓ 6	9381-1916-01			Blue UL1007AWG26 ℓ =100	1
ℓ 14	9381-1925-01			Green UL1095AWG28 ℓ =130	1
Tu1	9384-2905-01		Tube	AWG18 ℓ =10	1
②	8808-1027-01		Connector-A		1
③	8808-1028-01		Connector-B		1

Assy. Part No. 8808-0121-01 Assy. Part Name フレキシブル基板Bセット
P.C. board-B set

Symbol	Part No.	Com	Part Name	Typ.	Qty.
D1	9361-2082-11		Diode	10D8	1
D7	9361-2085-01			SRIFM-12K	1
D10	9353-2181-01		Photo diode	LN-25CPW	1
Q8	9363-1080-21		Transistor	2SA1115	1
Q9	9360-1080-31		Photo transistor	PN-126S	1
R11 R10 R9	9422-1036-81		Fixed resistor	1/8W 10K Ω	3
C16	9548-4735-81		Condenser	0.047 μ FM35II-D	1
T2	9324-2081-01		Trigger coil	NC850	1
L1	9320-0080-01		Inductor	272L1	1
ℓ 3	9381-1913-01		Lead wire	Orange UL1007AWG26 ℓ =70	1
ℓ 5	9381-1914-01			Yellow UL1007AWG26 ℓ =60	1
ℓ 8	9381-1921-01			Brown UL1095AWG28 ℓ =70	1
ℓ 9	9381-1922-01			Red UL1095AWG28 ℓ =60	1
ℓ 10	9381-1923-01			Orange UL1095AWG28 ℓ =80	1
ℓ 11	9381-1923-01			Orange UL1095AWG28 ℓ =170	1
ℓ 12	9381-1024-01			Yellow UL1095AWG28 ℓ =70	1
ℓ 15	9381-1926-01			Blue UL1095AWG28 ℓ =100	1
ℓ 16	9381-1927-01			Purple UL1095AWG28 ℓ =120	1
ℓ 18	9381-1928-01			Grey UL1095AWG28 ℓ =110	1
ℓ 20	9381-1929-01			White UL1095AWG28 ℓ =110	1
Tu3	9384-2905-01		Tube	AWG18 ℓ =3	2
①	8808-1010-01		Photo diode holder		1

AUTO ELECTRO FLASH 280PX

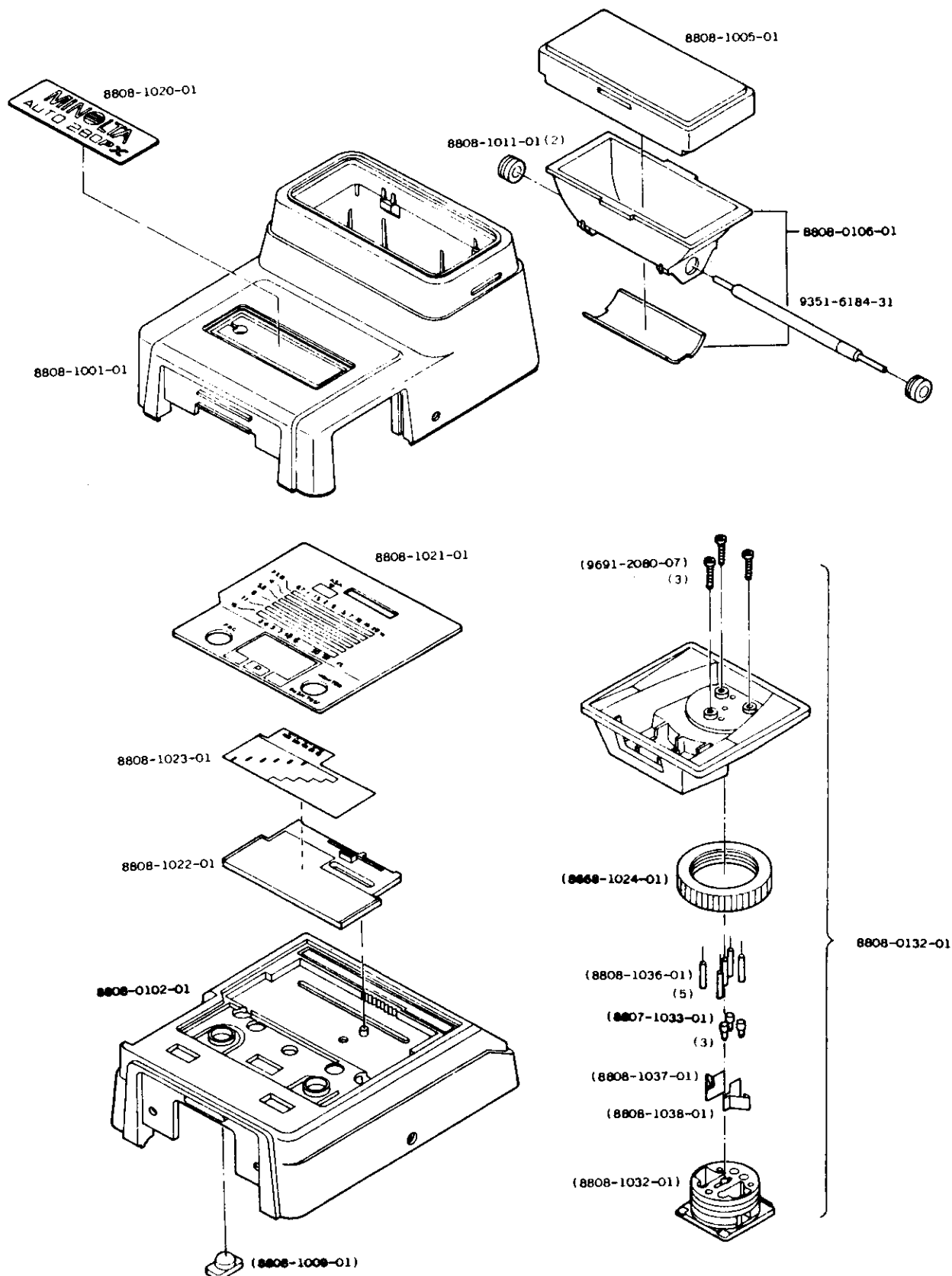
CODE No. 8808



Part No.	Part Name		Qty
8808-0102-01	Rear cover set	本体モールドBセット	1
(8808-1009-01)	Test button	単発釦	1
8808-0106-01	Reflector set	反射傘セット	1
8808-0132-01	Hot shoe set	シューセット	1
(8668-1024-01)	Shoe nut	シューナット	1
(8808-1032-01)	Shoe case	シューケース B	1
(8807-1033-01)	Sync. contact	シュー接点	3
(8808-1036-01)	Contact spring	シュー接点ばね	5
(8808-1037-01)	Shoe contact	シュー (一) 接片	1
(8808-1038-01)	Shoe contact-B	シュー (一) 接片B	1
(9691-2080-07)	Phillips type tapping screw	十字穴付タッピングねじ	3
8808-1001-01	Front cover	本体モールドA	1
8808-1005-01	Panel	パネル	1
8808-1011-01	Xe. bushing	Xe ブッシング	2
8808-1020-01	Name plate	前銘板	1
8808-1021-01	Indication plate	表示室	1
8808-1022-01	Calculation plate	露出計算板	1
8808-1023-01	Film speed plate	露出銘板	1
9351-6184-31	Xe. tube	Xe. チューブ	1

AUTO ELECTRO FLASH 280PX

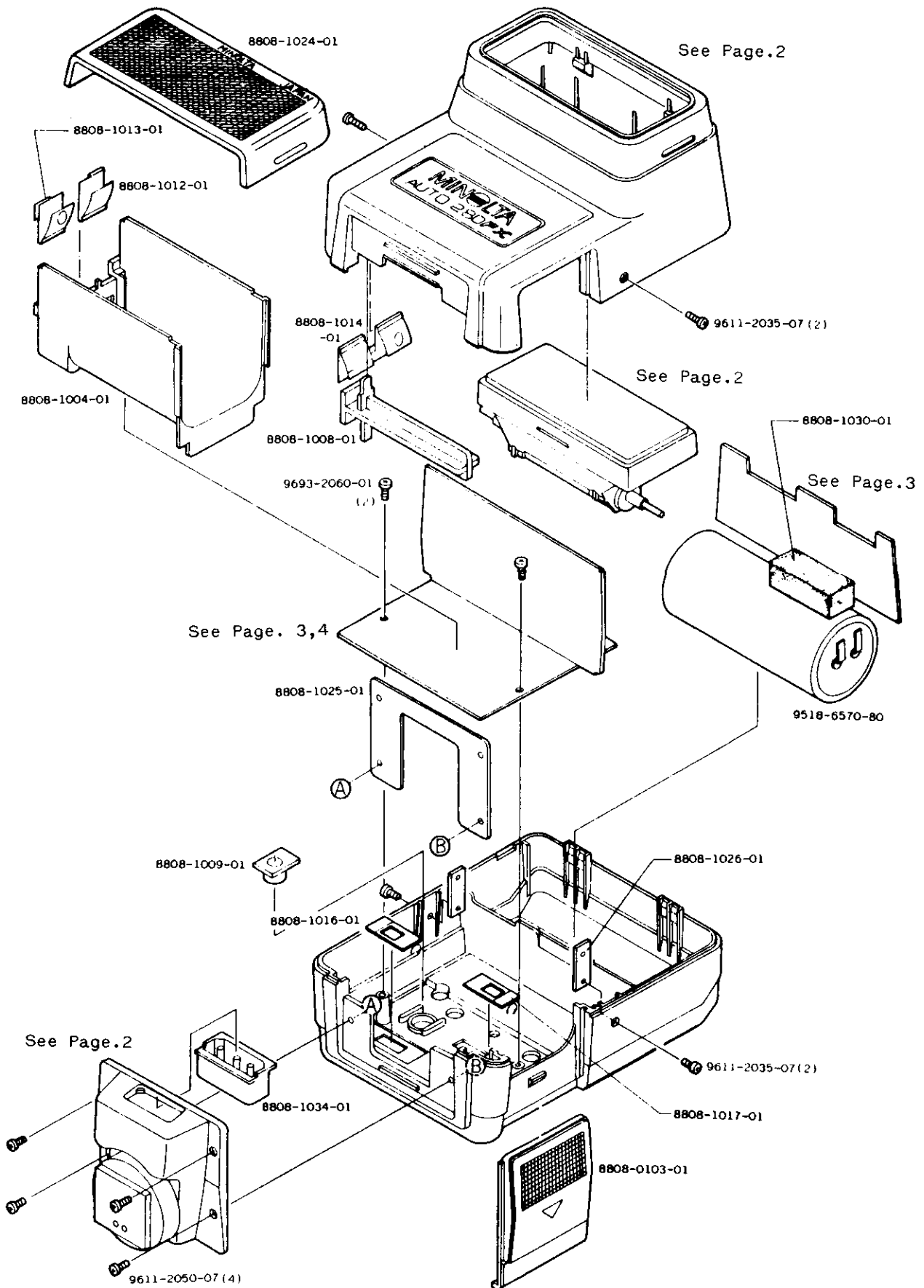
CODE No. 8808



Part No.	Part Name		Qty
8808-0103-01	Battery chamber cover set	電池蓋セット	1
8808-1004-01	Battery chamber	電池室モールド	1
8808-1008-01	Battery separator	電池セパレータ	1
8808-1009-01	Test button	単発釦	1
8808-1012-01	Battery ⊕ contact	電池プラス接片	1
8808-1013-01	Battery ⊖ contact	電池マイナス接片	1
8808-1014-01	Battery contact	電池共通接片	1
8808-1016-01	Power switch plate	スイッチ銘板	1
8808-1017-01	Hi/Lo changeover switch plate	スイッチ銘板-B	1
8808-1024-01	28mm wide panel	28mm ワイドパネル	1
8808-1025-01	Shoe set plate	シュー止め板	1
8808-1026-01	Nut	横止めナット	2
8808-1030-01	Sponge	スポンジ	1
8808-1034-01	Connector	コネクター	1
9611-2035-07	Phillips type screw	十字穴付なべ頭小ねじ	4
9611-2050-07	Phillips type screw	十字穴付なべ頭小ねじ	4
9693-2060-01	Phillips type tapping screw	十字穴付タッピングねじ	2
9518-6570-80	Main condenser (C10:650μF350V)	メインコンデンサー(C10)	1

AUTO ELECTRO FLASH 280PX

CODE No. 8808



I N D E X

Part No. Page

9320-0180-01-----4

Switch

9333-2081-51-----4

Lead wire

9381-1910-01----3,4,5

9381-1912-01-----3,5

9381-1913-01-----3,5

9381-1914-01-----3,5

9381-1916-01-----3,5

9381-1920-01-----4,5

9381-1921-01-----3,5

9381-1922-01-----3,5

9381-1923-01-----3,5

9381-1924-01----3,4,5

9381-1925-01-----3,5

9381-1926-01-----3,5

9381-1927-01----3,4,5

9381-1928-01----3,4,5

9381-1929-01----3,4,5

Tube

9384-2905-01-----3,4

I N D E X

Part No.	Page	Part No.	Page	Part No.	Page
9363-1181-01-----3		9422-2216-81-----4		9535-2245-80-----3	
9363-2080-31-----3		9422-2416-81-----4			
		9422-2736-81-----4		9544-1033-80-----4	
Thyristor		9422-3326-81-----4		9545-6833-80-----4	
9365-1081-21-----3		9422-3336-81-----4		9545-6834-80-----3	
9365-1081-31-----3		9422-4716-81-----4		9548-3354-80-----3	
9365-1181-01-----3		9422-5616-81-----4		9548-4735-80-----3	
9365-1181-02-----3				9548-4735-81-----3	
		9423-5644-81-----4		9548-6835-80-----3	
Fixed resistor		9423-6846-81-----4		9563-5035-80-----3	
9413-1017-80-----3		9423-9146-81-----4		9564-1014-80-----4	
9413-1027-80-----3				9564-1035-80-----3	
9413-1537-80-----3		9435-1036-80-----3		9564-3325-80-----3,4	
9413-1557-80-----3		9435-8226-80-----3		9564-4725-80-----4	
9413-2207-80-----3		9436-1536-80-----3		9564-6825-80-----4	
9413-2227-80-----3					
9413-3307-80-----3		Variable resistor		9565-1024-80-----4	
9413-4707-80-----3		9462-2048-80-----4		9565-3325-80-----3	
		9462-5028-80-----4			
9422-1016-81-----4		Condenser		Transistor	
9422-1026-81-----4		9512-1075-80-----3		9324-1181-41-----3	
9422-1036-81-----3,4		9512-1075-81-----4		9324-2081-01-----3	
9422-1046-81-----4		9512-4765-80-----4		Inductor	
9422-1526-81-----4		9518-6570-80-----1		9320-0080-01-----3	
9422-1536-81-----4		9534-1055-80-----4		9320-0081-01-----3	

I N D E X

Part No.	Page	Part No.	Page	Part No.	Page
8808-0102-----	2	8808-1022-----	2	ELECTRO PARTS	
8808-0103-----	1	8808-1023-----	2	IC	
8808-0106-----	2	8668-1024-----	2	9360-0180-01-----	4
8808-0111-----	3	8808-1024-----	1		
8808-0121-----	3	8808-1025-----	1	Photo diode	
8808-0131-----	4	8808-1026-----	1	9353-2181-01-----	3
8808-0132-----	2	8808-1027-----	3		
		8808-1028-----	3	L.E.D	
8808-1001-----	2			9353-2083-01-----	4
8808-1004-----	1	8808-1030-----	1	9353-2184-01-----	4
8808-1005-----	2	8808-1032-----	2		
		8807-1033-----	2	Diode	
8808-1008-----	1	8808-1034-----	1	9361-2082-11-----	3,4
8808-1009-----	1,2	8808-1036-----	2	9361-2083-01-----	3
8808-1010-----	3	8808-1037-----	2	9361-2085-01-----	3
8808-1011-----	2	8808-1038-----	2	9361-2180-01-----	3
8808-1012-----	1			9361-4181-31-----	4
8808-1013-----	1	Screw			
8808-1014-----	1	9611-2035-07-----	1	Photo transistor	
8808-1016-----	1	9611-2050-07-----	1	9360-1080-31-----	3
8808-1017-----	1	9691-2080-07-----	2		
8808-1018-----	3	9693-2060-01-----	1	Transistor	
8808-1019-----	3			9362-1080-01-----	3,4
8808-1020-----	2	Xe. tube		9363-1080-21-----	3
8808-1021-----	2	9351-6184-31-----	2		

SERVICE MANUAL SUPPLEMENTARY INFORMATION

Model AUTO ELECTROFLASH 45FPX

Code No. 8808-200

■ 8808-200 Parts List

- This product (8808-200) goes on sale for the U.S. department stores with only its name plate changed from that of the Auto Electroflash 280PX (8808).

- Repair parts

The 8808-200 parts remain the same as those of the 8808 (280PX), except for the name plate that is exclusively used for the 8808-200.

Before marketing the product, 200 parts for exclusive use with 8808-200 will be distributed to the service station in New Jersey. For service use in any area other than NJ, place orders with the NJ service station for the required number of 8808-200 parts.

(We will accept any order for this part only through the NJ service station.)

- Parts List

Part No. 8808-2020-01

Part Name: Name plate

MINOLTA
AUTO 45FPX

MINOLTA AUTO ELECTROFLASH 280PX (8808)

General Description

The 280PX is a series control system, clip-on type automatic electronic flash with the guide number 28 (ASA/ISO 100-m) for exclusive with the X-700. Flash firing is controlled by means of auto flash control through direct light metering.

Type

- Series control system, auto electroflash through X-700 direct light measurement (provided with synchro auto control contact and direct auto control contact)
- Clip-on
- Direct contact (hot shoe) system

Interlocking Function with the X-700

The 280PX flashes automatically due to direct light metering when combined with the X-700 (interlocked with the program mode and aperture-priority mode). A flash-ready signal blinks in the finder. When the shutter is released, a synchronized speed is automatically obtained. When a optimum exposure has been obtained, the shutter speed is indicated in the finder after shooting.

Guide Number (ASA/ISO-m)

Hi-Lo Selectable

Wide Panel Light Quantity Selection Control ASA/ISO	None		In Use	
	Hi	Lo	Hi	Lo
400	56	14	40	10
200	40	10	28	7
100	28	7	20	5
50	20	5	14	3.5
25	14	3.5	10	2.5

Metering Range for Auto Flashing (On-camera ASA/ISO 100)

- 0.7 to 7m (F1.4 lens) for program auto flash(P mode).
- At aperture-priority auto flash (A mode):

Wide Panel Light Quantity Selection Control F-number	None		In Use	
	Hi	Lo	Hi	Lo
1.4	0.7~20	0.7~5	0.7~14	0.7~3.5
2	0.7~14	0.7~3.5	0.7~10	0.7~2.5
2.8	0.7~10	0.7~2.5	0.7~7	0.7~1.8
4	0.7~7	0.7~1.8	0.7~5	0.7~1.3
5.6	0.7~5	0.7~1.3	0.7~3.5	0.7~0.9
8	0.7~3.5	0.7~0.9	0.7~2.5	
11	0.7~2.5		0.7~1.8	
16	0.7~1.8		0.7~1.3	

Illuminating Angle and Applicable Lens

Wide Panel	Illuminating Angle		Lens Applicable (35mm Camera)
	Up/Down	Right/Left	
None	45°	60°	35mm or greater
Used	53°	70°	28mm or greater



Flash Time

Auto: Approx. 1/50000 to 1/1000sec.
Manual: Hi Approx. 1/1000sec.
Lo Approx. 1/10000sec.

Firing Frequency and Interval

(according to MINOLTA test conditions)

Light Quantity Selection Control Battery used	Firing Frequency (times)		Firing Interval (sec.)	
	Hi	Lo	Hi	Lo
Manganese Cell	70	1000	9	1
Alkaline Cell	200	2000	6	0.5
Ni-Cd Cell	100	600	3.5	0.3

The above figures very depending on the kind of battery (brand), production date, lapse of time after production and temperature of operating surroundings.

Quality of Light

Compatible with a daylight type color film.

Batteries used: 4 batteries either of the

Manganese dry battery (JIS, SUM-3)
Alkaline dry battery (JIS, LR-6)
Ni-Cd storage battery (JIS, KA-AA)
types.

Indication

Monitor Lamp

lights up when charging is completed.

The flash will not fire when this lamp does not light up Monitor lamp goes off with the power switch OFF. Monitor lamp with a window, an independent flash (red) button.

Confirmation of Flash-ready Condition

With the X-700 installed, touching or pressing the shutter release button lights the monitor lamp, and simultaneously indicates a flash-ready display in the view finder. (LED blinks beside "60" indication)

Optimum Exposure Indication

- When the 280PX is combined with the X-700, the LED beside the "60" in the view finder flashes approximately one second earlier after shooting if a optimum exposure has been obtained.
- When the 280PX is used in combination with the X-700, the FDC lamp lights up for about 2 seconds immediately after shooting if a optimum exposure has been obtained.

Size: 70(W)×102(H)×60(D)mm

Weight: 200g (not including batteries)

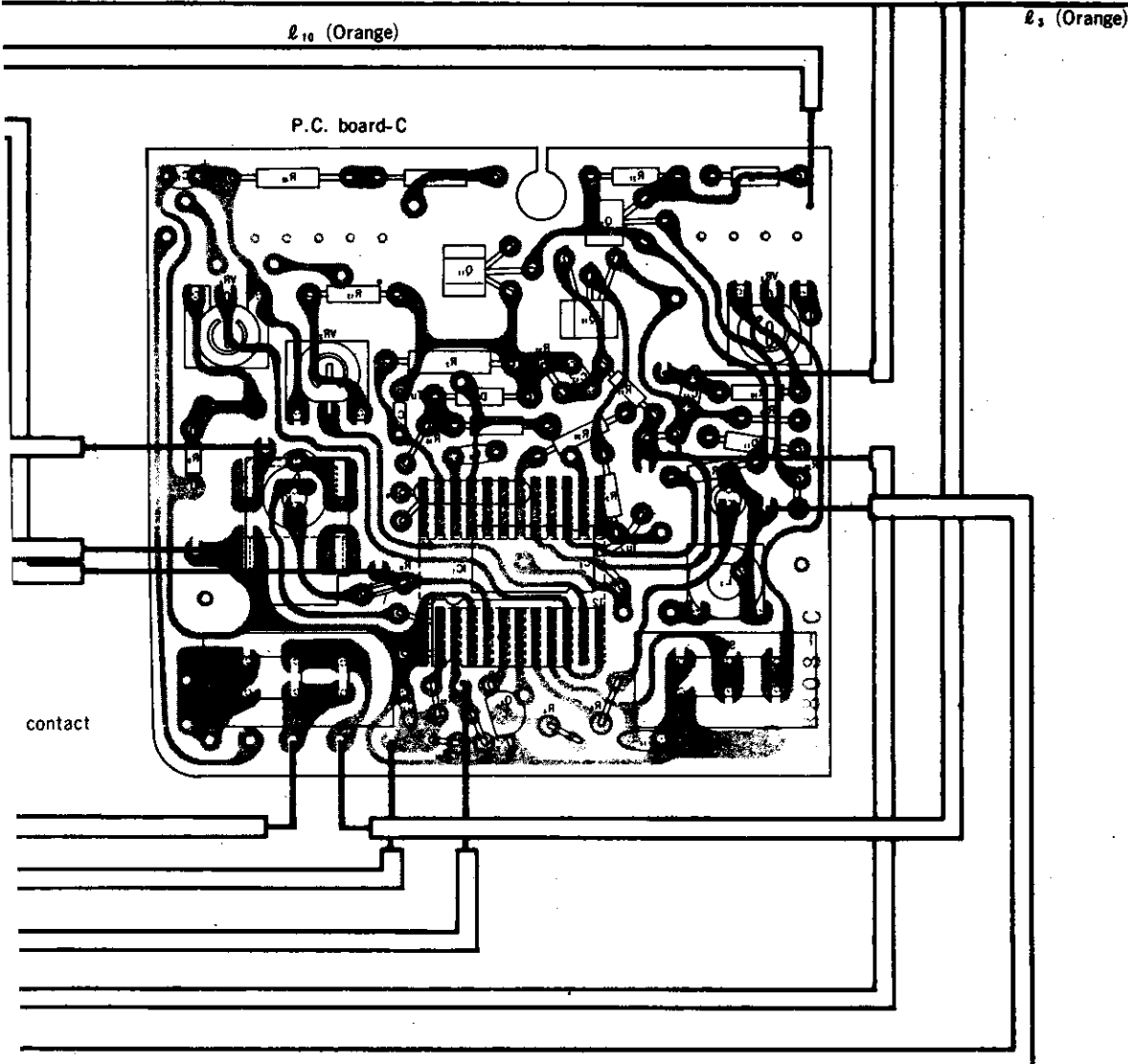
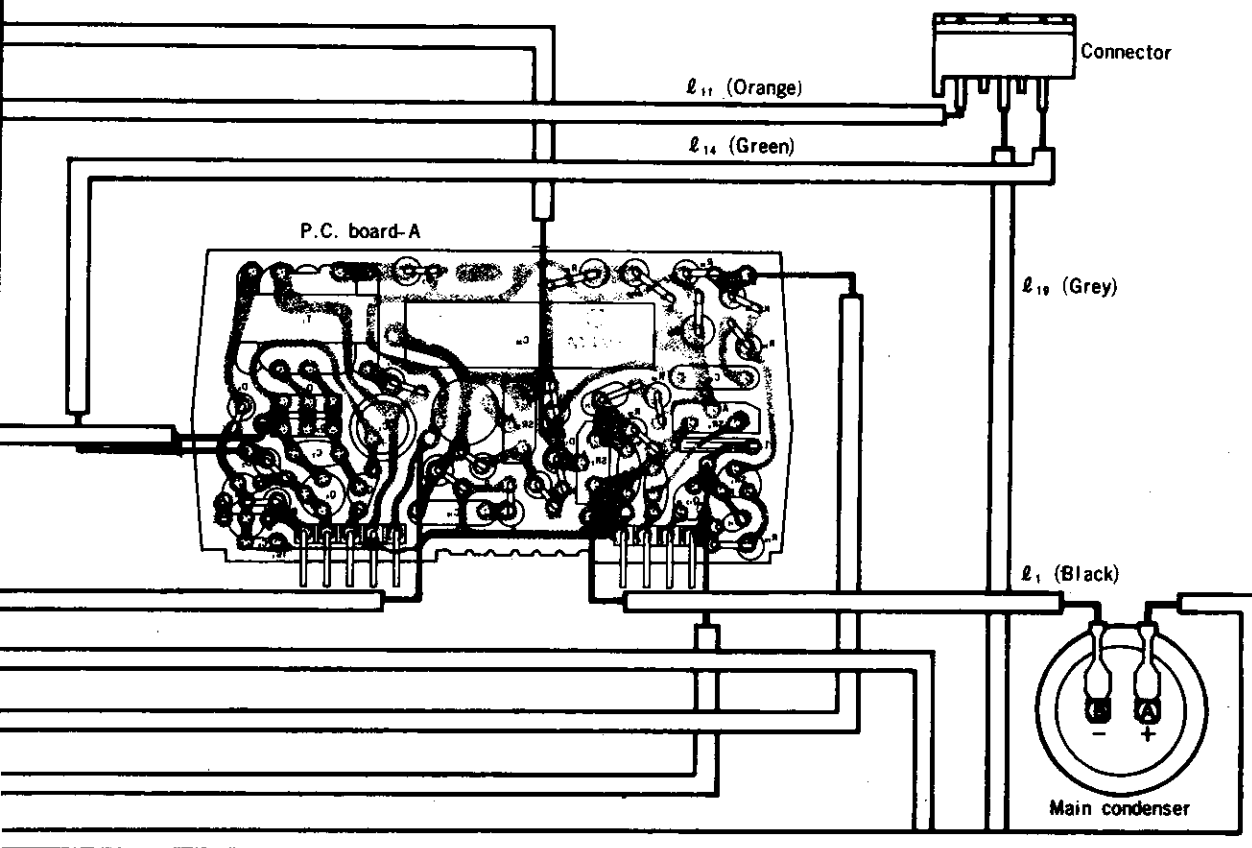
Date of Sale: October, 1981 (in Japan)

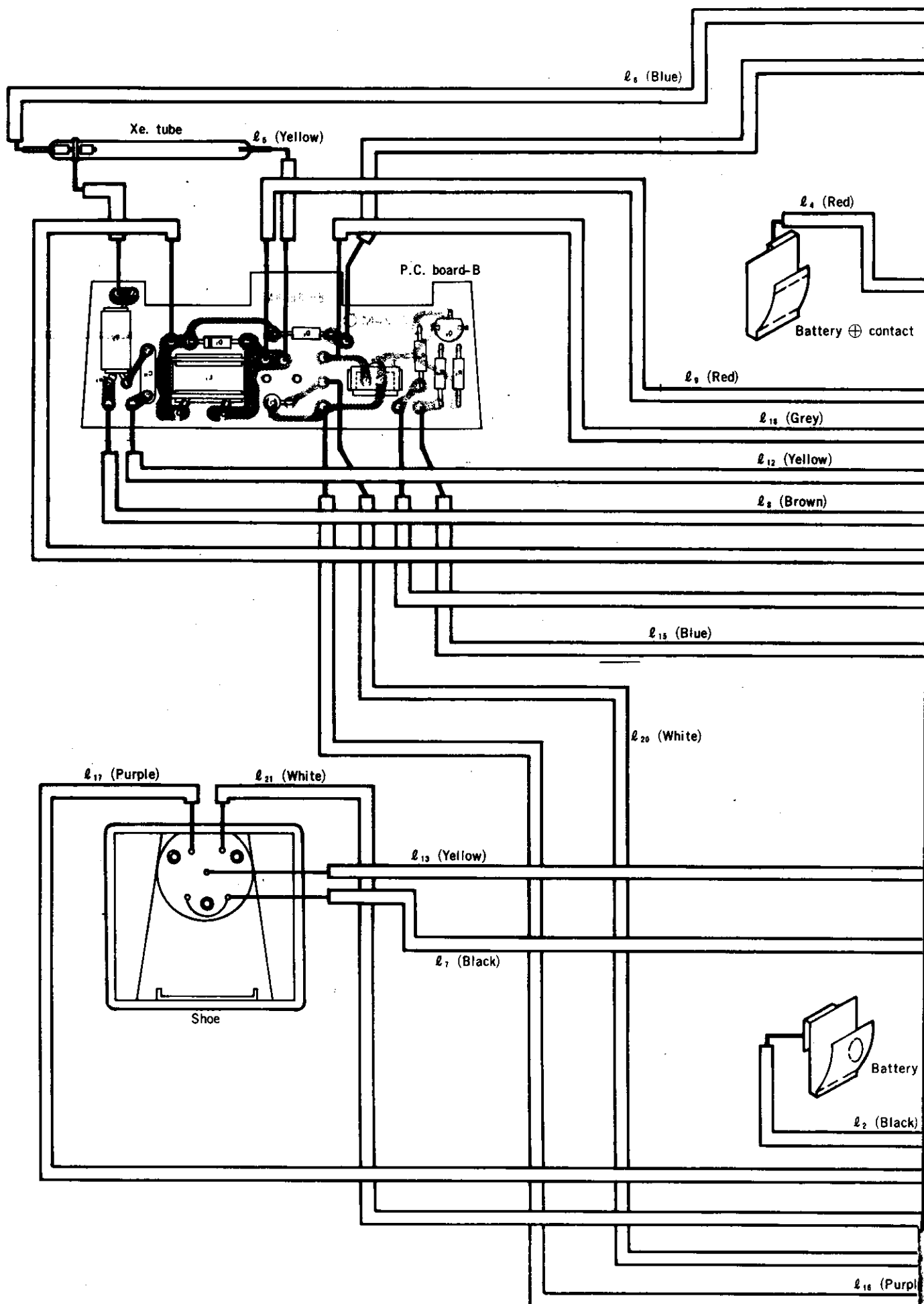
プリント基板 C セット

Assy. Part No. 8808-0131-01

Assy. Part Name P.C. board-C set

Symol	Part No.	Com.	Part Name	Typ.	Qty.
IC	9360-0180-01		IC	M54415P	1
D5	9353-2184-01			SLP-214B	1
D6	9353-2083-01		L.E.D	TLR-102	1
D9 D8	9361-2082-11			10D8	2
D11	9361-4181-31		Diode	MZ304	1
Q12 Q11 Q10 Q7	9362-1080-01		Transistor	2SC2603	4
R2	9423-5644-81		Fixed resistor	1/4W 560K Ω	1
R4	9422-1526-81			1/8W 1.5K Ω	1
R6 R5	9422-2416-81			1/8W 240K Ω	2
R17 R13 R8	9422-1036-81			1/8W 10K Ω	3
R14	9422-2736-81			1/8W 27K Ω	1
R27 R26 R15	9422-1026-81			1/8W 1K Ω	3
R25 R16	9422-2216-81			1/8W 220 Ω	2
R21 R18	9422-1046-81			1/8W 100K Ω	2
R20	9422-3336-81			1/8W 33K Ω	1
R22	9422-5616-81			1/8W 560 Ω	1
R23	9422-1536-81			1/8W 15K Ω	1
R24	9422-3326-81			1/8W 3.3K Ω	1
R28	9422-1016-81			1/8W 100 Ω	1
R38	9422-4716-81			1/8W 470 Ω	1
R41	9423-9146-81			1/8W 910K Ω	1
R42	9423-6846-81			1/4W 680K Ω	1
VR2 VR1	9462-5028-80		Variable resistor	5K Ω	2
VR3	9462-2048-80			200K Ω	1
C3	9564-4725-80		Condenser	4700PF 25V	1
C4	9544-1033-80			1000PF 25V	1
C6	9512-1075-81			100 μ F 10V S type	1
C7	9534-1055-80			1 μ F 25V	1
C8	9545-6833-80			0.068 μ F 50V	1
C9	9512-4765-80			47 μ F 10V	1
C11	9564-6825-80			6800PF 25V	1
C12	9565-1024-80			1000PF 50V	1
C13	9564-3325-80			3300PF 25V	1
C14	9564-1014-80			100PF 25V	1
L3	9320-0180-01		Inductor	CH14	1
S3 S1	9333-2081-51		Switch	SS-208AVO	2
ℓ 2	9381-1910-01		Lead wire	Black UL1007AWG26 ℓ =50	1
ℓ 7	9381-1920-01			Black UL1095AWG28 ℓ =120	1
ℓ 13	9381-1924-01			Yellow UL1095AWG28 ℓ =100	1
ℓ 17	9381-1927-01			Purple UL1095AWG28 ℓ =60	1
ℓ 19	9381-1928-01			Grey UL1095AWG28 ℓ =50	1
ℓ 21	9381-1929-01			White UL1095AWG28 ℓ =60	1
Tu4	9384-2905-01		Tube	AWG18 ℓ =6	2
Tu5	9384-2905-01			AWG18 ℓ =5	2
Tu6	9384-2905-01			AWG18 ℓ =5	1
①	8808-1018-01		Test button contact-A		1
②	8808-1019-01		Test button contact-B		1





Lead wires list

Symbol				Part No.	Color	Type.	Qty.
			ℓ1	9381-1910-01	Black	UL1007AWG26 ℓ=60	1
			ℓ2	9381-1910-01	Black	UL1007AWG26 ℓ=50	1
			ℓ3	9381-1913-01	Orange	UL1007AWG26 ℓ=70	1
			ℓ4	9381-1912-01	Red	UL1007AWG26 ℓ=60	1
			ℓ5	9381-1914-01	Yellow	UL1007AWG26 ℓ=60	1
			ℓ6	9381-1916-01	Blue	UL1007AWG26 ℓ=100	1
			ℓ7	9381-1920-01	Black	UL1095AWG28 ℓ=120	1
			ℓ8	9381-1921-01	Brown	UL1095AWG28 ℓ=70	1
			ℓ9	9381-1922-01	Red	UL1095AWG28 ℓ=60	1
			ℓ10	9381-1923-01	Orange	UL1095AWG28 ℓ=80	1
			ℓ11	9381-1923-01	Orange	UL1095AWG28 ℓ=170	1
			ℓ12	9381-1924-01	Yellow	UL1095AWG28 ℓ=70	1
			ℓ13	9381-1924-01	Yellow	UL1095AWG28 ℓ=100	1
			ℓ14	9381-1925-01	Green	UL1095AWG28 ℓ=130	1
			ℓ15	9381-1926-01	Blue	UL1095AWG28 ℓ=100	1
			ℓ16	9381-1927-01	Purple	UL1095AWG28 ℓ=120	1
			ℓ17	9381-1927-01	Purple	UL1095AWG28 ℓ=60	1
			ℓ18	9381-1928-01	Grey	UL1095AWG28 ℓ=110	1
			ℓ19	9381-1928-01	Grey	UL1095AWG28 ℓ=50	1
			ℓ20	9381-1929-01	White	UL1095AWG28 ℓ=110	1
			ℓ21	9381-1929-01	White	UL1095AWG28 ℓ=60	1

REPAIR GUIDE

	Page
1 Adjustment and checking procedure	1 ~ 4
■ Capacitor discharging procedure	1
■ Monitor lamp lighting voltage adjustment	1
■ Monitor circuit voltage adjustment	2
■ Lo guide number adjustment	3
■ Measuring instruments and power supply adapter cover	4
2 Trouble shooting chart	5
3 Checking Table	6 ~ 12
■ Checks classified by types of trouble	6 ~ 9
■ Checks of electrical parts	10 ~ 12
■ Check points	12
■ Circuit Diagram	13
■ Wiring Diagram	14

1 Adjustment and checking procedure

■ Instruments to be prepared

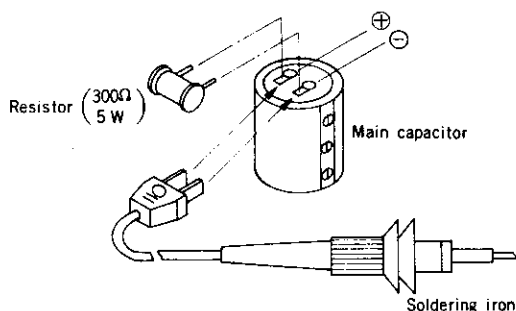
1. Strobe tester (Model ST-III, ST-II or ST-I)
2. Constant voltage D.C power supply (Model 524B, E-1, E-2)
3. Digital multimeter (Type 2508, 3476, 2507)
4. Reflection paper $1.3\text{m} \times 2\text{m}$ (Seamless paper 22 of Superior make)
5. Power supply adapter (8646-1034-79 or 461-1023-75)
6. Power supply adapter cover
7. Screwdriver for luminance correction
8. Tripod
9. Camera (with hot shoe)

■ Capacitor discharging procedure

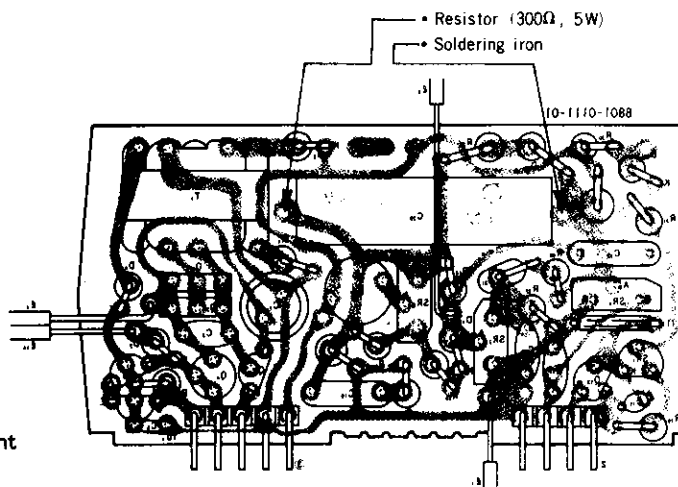
■ During disassembly, discharge the capacitor as follows :

Use a resistor ($200\Omega \sim 300\Omega$, $2\text{W} \sim 5\text{W}$) or the plug of a soldering iron.

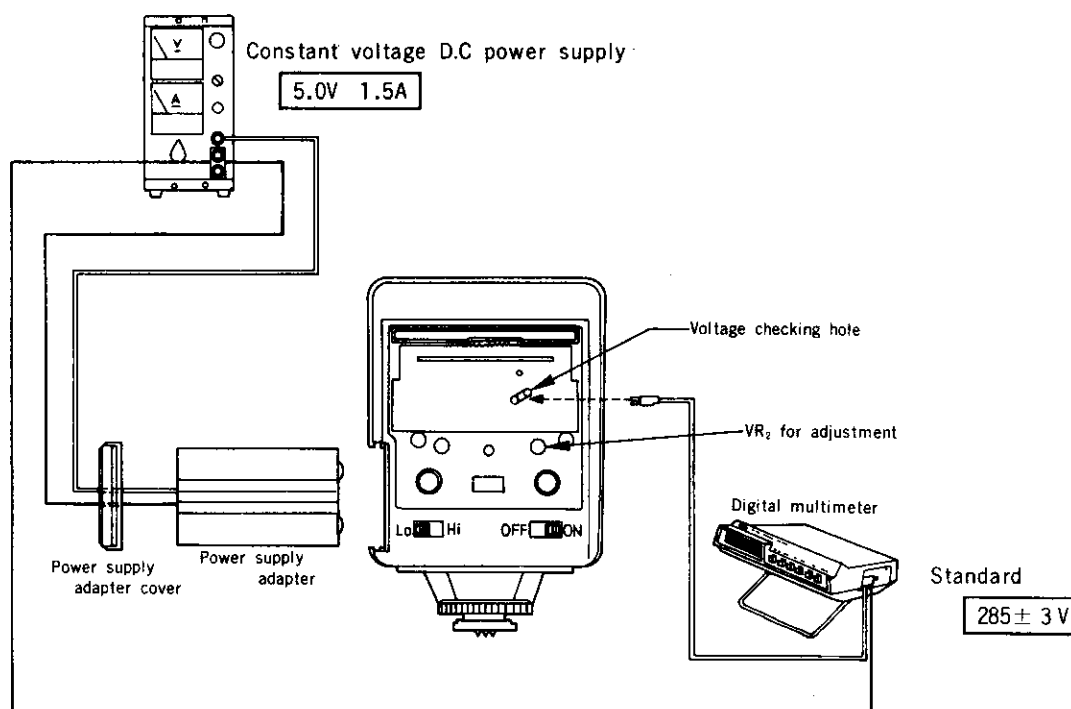
• Main capacitor (C_{10})



• Commutation capacitor (C_{20})



■ Monitor lamp lighting voltage adjustment

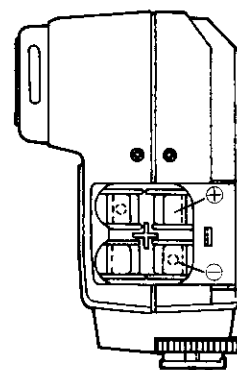


1. Connect the constant voltage D.C power supply to the strobe, and also connect the digital multimeter to the strobe and constant voltage D.C power supply, as illustrated above.

Caution

Connect the power supply adapter (8646-1034-79) or 461-1023-75) to the strobe according to the polarity of the battery contact shown on the right.

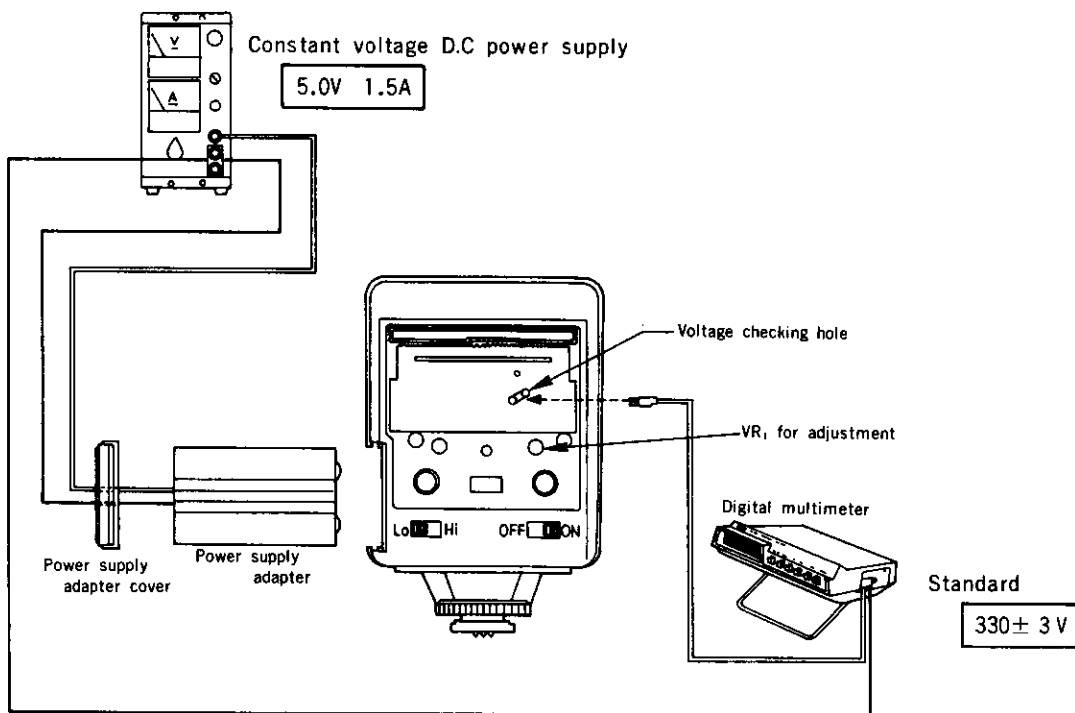
2. With the strobe charged, check if the indication of the digital multimeter is within $285V \pm 3V$ when the monitor lamp lights up.
3. If it is outside the standard, adjust it by turning VR_2 .
4. When it exceeds $285V \pm 3V$ during adjustment, be sure to flash the strobe before re-adjustment.

**Procedure**

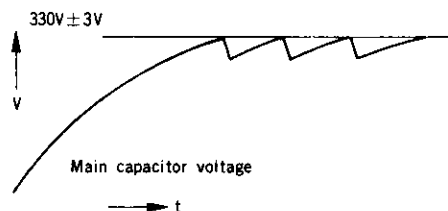
- If the voltage rise is very fast, making it difficult to check the monitor lamp lighting. Set the output voltage a little lower than 5V for the adjustment.
- If the voltage rise is very slow and it takes a long time to reach the point for monitor lamp lighting, set the voltage a little higher than 5V so that the adjustment will be easier.

■ Monitor circuit voltage adjustment

1. Make the connections as shown below. (The procedure is the same as for monitor lamp lighting voltage adjustment.)

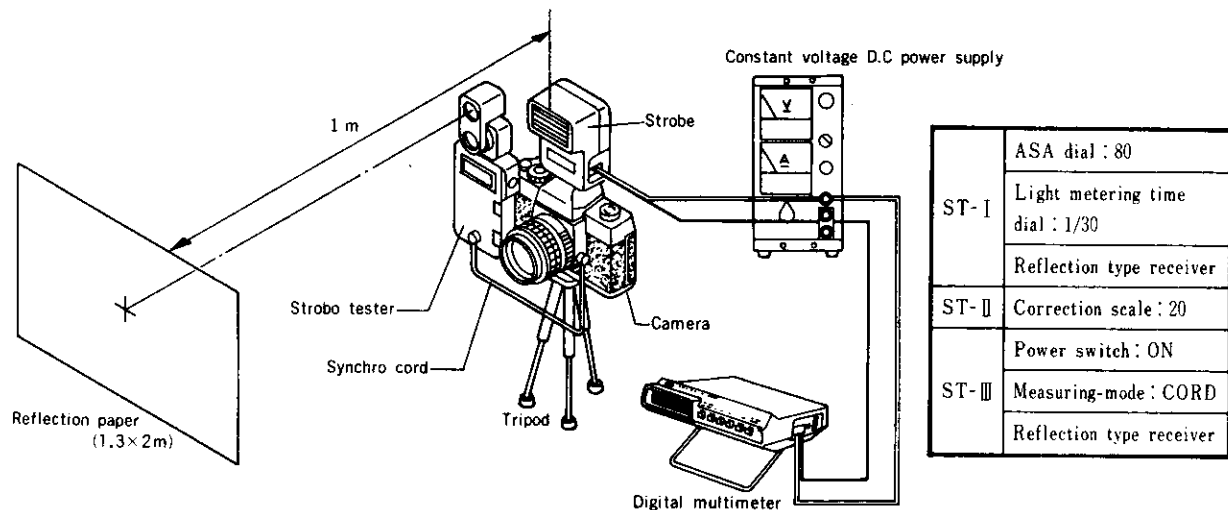


2. When the strobe is charged and the monitor circuit is operated, measure the voltage of main capacitor with the digital multimeter as shown above. Then adjust by turning VR_1 to make the voltage $330 \pm 3V$.



■ Lo guide number adjustment

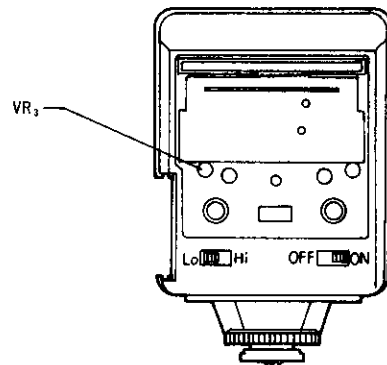
1. Set the reflection paper, camera, strobe, tripod and strobe tester as illustrated below.



2. Set the strobe's Hi-Lo switch to "Lo", camera to manual mode, and then flash the strobe.
3. Read the indication of the strobe tester to check if it is within the standard (main capacitor voltage 330V)

Standard	$F NO 5.6^{+0.7EV}_0$	(F NO 5.60 ~ F NO 5.67)
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4. If the indication is deflected, adjust it by turning VR₃ shown below.



5. Checks

- Continuous synchro flash during use of auto winder.

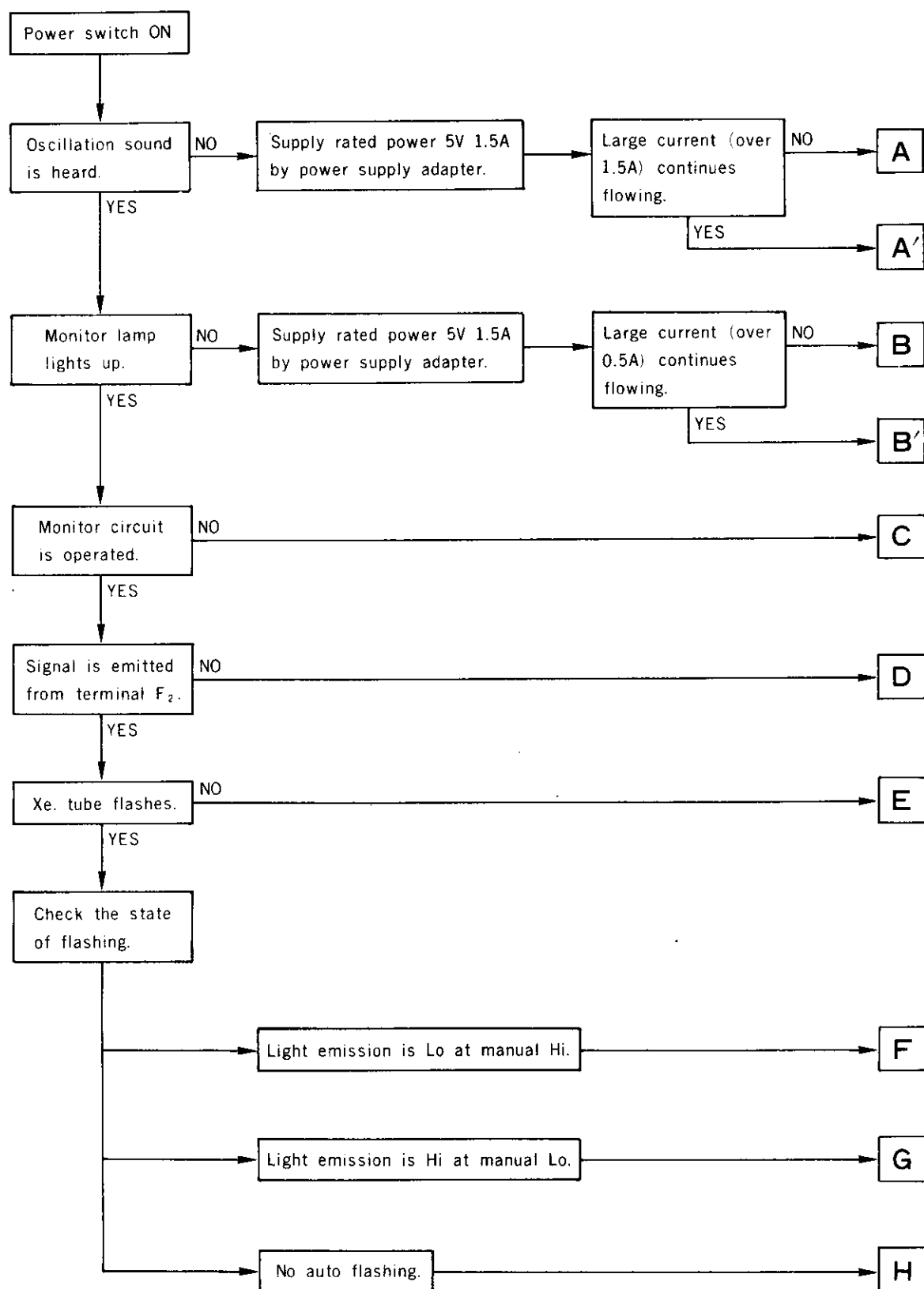
Connect strobe to a camera with auto winder, shift the selector switch to "Low", turn the main switch (strobe) ON, then make sure the monitor lamp is lit. Look into the viewfinder on the camera side to see that the preparation for flashing has been completed (LED of '60' blinks), and then make sure that it flashes 40 times consecutively with the shutter button pressed.

If the flashing is incomplete, replace the Ni-Cd battery and re-check the Lo guide number mentioned above.

Caution

- Fully charged Ni-Cd battery should be used as the power source.
- Camera mode must be set to "M". (In case of X-700)

2 Trouble shooting chart



3 Checking Table

- ⊙ Remove the top and bottom cover of the main body.
- ⊙ Supply rated power 5.0V 1.5A by connecting constant voltage D.C power supply leads (+, -) to the battery contacts of the strobe.
- ⊙ When checking in operation using constant voltage D.C power supply, never touch patterns other than those specified.
- ⊙ ① type of trouble, ② check point, ③ how to check and find defects, and ④ parts checked are mentioned as follows. Some are mentioned in the separate section for checks of electrical elements. Regarding the parts checked, refer to Fig. No. given on the right side of the checking table.

(Example)

①Type	②Check point	③How to check and find defects	④Parts checked
A-1	Diode D ₁	Remove D ₁ from board and check with reference to Check-3.	Refer to Fig. 1, A-1, P. 2.

■ Checks classified by types of trouble

Type	Check point	How to check and find defects	Parts checked										
A-1	Power switch S ₁₋₂	<p>• Check switch conduction by tester without power supply. Touch positions ① and ② of printed circuit board C with tester, and then the following should be satisfied.</p> <table border="1"><tr><td>Power SW position</td><td>Set the tester between ① and ②.</td></tr><tr><td>ON</td><td>Indicator deflects.</td></tr><tr><td>OFF</td><td>Indicator does not deflect.</td></tr></table>	Power SW position	Set the tester between ① and ②.	ON	Indicator deflects.	OFF	Indicator does not deflect.	Fig. 2 A-1 ①, ②				
Power SW position	Set the tester between ① and ②.												
ON	Indicator deflects.												
OFF	Indicator does not deflect.												
A-2	Battery contact leads	<p>• Touch positions ③ and ④ of battery contact of printed circuit boards A, C with tester. Then the following should be satisfied.</p> <table border="1"><tr><td>Pattern position ③ and battery contact ⊕</td><td rowspan="2">Tester indicator deflects.</td></tr><tr><td>Pattern position ② and battery contact ⊖</td></tr></table>	Pattern position ③ and battery contact ⊕	Tester indicator deflects.	Pattern position ② and battery contact ⊖	Fig. 1, 2 A-2 ③, ④							
Pattern position ③ and battery contact ⊕	Tester indicator deflects.												
Pattern position ② and battery contact ⊖													
A-3	Transistors Q ₁ , Q ₂ Q ₃ , Q ₇	<p>• Supply rated power (5.0V 1.5A). If ammeter needle deflects slightly, remove the transistors from P.C board and check conduction of B, C, E with tester. Refer to Check 4 (Q_{1, 2, 3} : pnp, Q₇ : npn)</p>	Fig. 3, 4 A-3										
A-4	Oscillation transformer T ₁	<p>• Remove T₁ from P.C board and check conduction between terminals.</p> <table border="1"><tr><th>Measurement</th><th>Tester indication</th></tr><tr><td>1 - 2</td><td>0 Ω</td></tr><tr><td>3 - 4</td><td>0 Ω</td></tr><tr><td>3 - 6</td><td>0 Ω</td></tr><tr><td>3 - 5</td><td>240Ω</td></tr></table>	Measurement	Tester indication	1 - 2	0 Ω	3 - 4	0 Ω	3 - 6	0 Ω	3 - 5	240Ω	Fig. 1 A-4
Measurement	Tester indication												
1 - 2	0 Ω												
3 - 4	0 Ω												
3 - 6	0 Ω												
3 - 5	240Ω												
A-5	Diode D ₃	<p>• Remove D₃ from P.C board and check conduction between anode and cathode by tester. Refer to Check 3.</p>	Fig. 4 A-5										

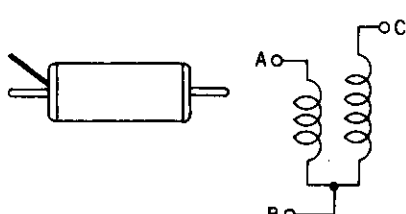
Type	Check point	How to check and find defects	Parts checked
A'-1	Transistors Q ₁ , Q ₂	<ul style="list-style-type: none"> Supply rated power (5.0V 1.5A). Check if Q ₁ and Q ₂ gain heat. If so, remove them from P.C board and check conduction of B, C, E by tester. Refer to Check 4 PNP.	Fig. 4 A-3
A'-2	Capacitor C ₂	<ul style="list-style-type: none"> Remove C₂ from P.C board and check conduction by tester (range: $\Omega \times 10K$). If indicator deflects.....defect is due to leakage or short-circuit. If indicator does not deflect.....No trouble. Refer to Check-2.	Fig. 4 A'-2
A'-3	IC IC-1	<ul style="list-style-type: none"> Supply rated power (5.0V 1.5A). Touch IC by hand to check if IC is hot. If so, IC is defective.	Fig. 2, 3 A'-3

B-1	Semi-fixed resistor VR ₂	<ul style="list-style-type: none"> Remove VR₂ from P.C board. With tester set to both terminals, the resistance value should change constantly when it is gradually adjusted. 	Fig. 3 B-1
B-2	IC IC-1	<ul style="list-style-type: none"> Supply rated power (5.0V 1.5A). Check the signal output at pin 5 of IC-1. When voltage at pin 11 is as specified (about 1.08V), the potential of pin 5 should decrease.	Fig. 2, 3 B-2
B-3	Monitor lamp D ₅	<ul style="list-style-type: none"> Remove D₅ from P.C board and check conduction between A and K. Refer to Check-3.	Fig. 3 B-3

B'-1	S. C. R SR ₄	<ul style="list-style-type: none"> Remove SR₄ from P.C board and check. Refer to Check-5.	Fig. 4 B'-1
B'-2	Capacitor C ₂₀ , C ₂₁	<ul style="list-style-type: none"> Supply rated power (5.0V 1.5A). Measure voltage at both terminals of C ₂₀ , C ₂₁ . They are acceptable if the voltage is about 300V or over. If not, remove them from P.C board and check by tester. Refer to Check-2.	Fig. 4 B'-2
B'-3	Main capacitor C ₁₀	<ul style="list-style-type: none"> Supply rated power (5.0V 1.5A) After completion of charge, measure voltage of C ₁₀ . It should be about 330V.	Refer to wiring diagram

C-1	Semi-fixed resistor VR ₁	<ul style="list-style-type: none"> Remove VR₁ from P.C board. With tester set to both terminals, the resistance value should change constantly when it is gradually adjusted. Refer to Check-7.	Fig. 3 C-1
C-2	IC IC-1	<ul style="list-style-type: none"> Supply rated power (5.0V 1.5A). When the voltage at pin 12 of IC-1 is as specified, a signal at about 1V should be delivered from pin 6.	Fig. 2 B-2
C-3	Transistors Q ₃ , Q ₇	<ul style="list-style-type: none"> Remove Q₃ and Q₇ from P.C board and check conduction of E, C, B by tester. Refer to Check-4. (Q ₃ : pnp, Q ₇ : npn)	Fig. 3, 4 C-3

Type	Check point	How to check and find defects	Parts checked
D-1	IC IC-1	<ul style="list-style-type: none"> Supply rated power (5.0V 1.5A). Measure signal at pin 3 of IC-1. Signal (charge completion signal) should be emitted at the same time with the monitor lamp ON. 	Fig. 2, 3 B-2
D-2	Leads and soldering	<ul style="list-style-type: none"> Check conduction of leads and soldering. Hot shoe mechanism. 	Refer to wiring diagram

E-1	Leads and soldering	<ul style="list-style-type: none">• Check conduction of leads and soldering.<ol style="list-style-type: none">1. Xe. tube (ℓ_5, ℓ_6)2. Main capacitor (ℓ_1, ℓ_3)3. Hot shoe (ℓ_{13}, ℓ_7)	Refer to wiring diagram								
E-2	Shoe spring and contacts	<ul style="list-style-type: none">• Deformed spring or spring that has lost tension causes defective contacts. Correct or replace them. Refer to wiring diagram.	Refer to wiring diagram								
E-3	Xe. tube Xe. Trigger coil T_2 Capacitor C_{16} S.C.R SR_1 Transistors Q_8, Q_{13} IC IC-1	<ul style="list-style-type: none">• Supply rated power (5.0V 1.5A). <p>Test 1</p> <div><div>Measure voltage at both terminals of C_{16}.</div><div>↓</div><div>About 300V</div><div>No. → SR₁ defective See Check-5. C_{15} defective See Check-2. T_2 defective (See Sec. E-4)</div><div>Yes ↓</div></div> <p>Test 2</p> <div><div>Short-circuit between A and K of SR_1 for a moment and check if Xe. tube flashes.</div><div>↓ Yes</div><div>SR₁ defective See Check-5. Q_8 defective See Check-4. Q_{13} defective See Check-4. IC-1 defective (B-2)</div><div>↓ No.</div><div>Xe. tube defective (check visually) T_2 defective (See Sec. E-4)</div></div>	Fig. 5 E-3 Fig. 4, 5 E-3 Refer to wiring diagram Fig. 4, 5 E-3								
E-4	Trigger coil T_2	<ul style="list-style-type: none">• Check conduction by tester. <div></div> <table><thead><tr><th>Terminals</th><th>Ohm values</th></tr></thead><tbody><tr><td>A-B</td><td>0.2Ω</td></tr><tr><td>A-C</td><td>About 130Ω</td></tr><tr><td>B-C</td><td>About 130Ω</td></tr></tbody></table> <p>Specifications in the table should be satisfied.</p>	Terminals	Ohm values	A-B	0.2Ω	A-C	About 130Ω	B-C	About 130Ω	Fig. 5 E-4
Terminals	Ohm values										
A-B	0.2Ω										
A-C	About 130Ω										
B-C	About 130Ω										

Type	Check point	How to check and find defects	Parts checked									
F- 1	Switch S ₃	<div>• Check conduction of S₃ by tester. Set the tester to positions ③ and ④, ④ and ⑤ of printed circuit board C. Then the following should be satisfied.</div> <table><tr><td>Power switch position</td><td>Set the tester between ③ and ④</td><td>Set the tester between ④ and ⑤</td></tr><tr><td>Lo</td><td>Indicator deflects.</td><td>Indicator does not deflect.</td></tr><tr><td>Hi</td><td>Indicator does not deflect.</td><td>Indicator deflects.</td></tr></table>	Power switch position	Set the tester between ③ and ④	Set the tester between ④ and ⑤	Lo	Indicator deflects.	Indicator does not deflect.	Hi	Indicator does not deflect.	Indicator deflects.	Fig. 2 F- 1 ③, ④, ⑤
Power switch position	Set the tester between ③ and ④	Set the tester between ④ and ⑤										
Lo	Indicator deflects.	Indicator does not deflect.										
Hi	Indicator does not deflect.	Indicator deflects.										
F- 2	IC IC- 1	<div>• Signal at pin 15 of IC-1 is wrong.</div>	Fig. 2, 3 B- 2									

G-1	Switch S ₃	<ul style="list-style-type: none"> Check conduction of S₃ by tester. Refer to Sec. F-1. 	Fig. 2, F-1 ③, ④, ⑤
G-2	LED D ₁₀	<ul style="list-style-type: none"> Remove D₁₀ from P.C board and check conduction between A and K by tester. Refer to Check-3. 	Fig. 5 G-2
G-3	Photo transistor Q ₉	<ul style="list-style-type: none"> Remove Q₉ from P.C board and check conduction by tester. Refer to Check 6. 	Fig. 5 G-3
G-4	IC IC-1	<ul style="list-style-type: none"> Check if signal is delivered from pin 15 of IC-1 at the time of flashing. 	Fig. 2, 3 B-2

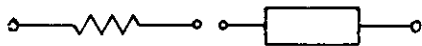
H-1	IC IC-1	<ul style="list-style-type: none"> Check if signal is emitted from pin 15 of IC-1 when auto signal enters terminal F₃ from camera. 	Fig. 2, 3 B-2
H-2	Transistors Q ₁₀ , Q ₁₁ , Q ₁₂	<ul style="list-style-type: none"> Remove Q₁₀ and Q₁₁ from P.C board and check conduction of E, C, B. Refer to Check 4. 	Fig. 3 H-2
H-3	Photo transistor Q ₉	<ul style="list-style-type: none"> Remove Q₉ from P.C board and check conduction by tester. Refer to Check-6. 	Fig. 5 G-3
H-4	S. C. R SR ₂ , SR ₄	<ul style="list-style-type: none"> Remove SR₂ and SR₄ from P.C board and check. Refer to Check-5. 	Fig. 4 H-4

■ Checks of electric elements

Check-1

● How to check resistor (R)

- To check for conduction, set the tester to both terminals of resistor.



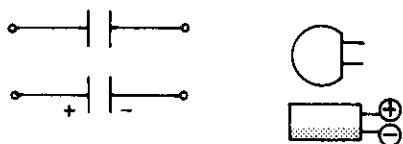
Check-2

● How to check capacitor (C)

- Set the tester to both terminals of capacitor to check for conduction.

Capacitors of large capacity, such as the main capacitor, are acceptable when the tester indicator greatly deflects and gradually returns to zero.

(This is due to residual potential.)

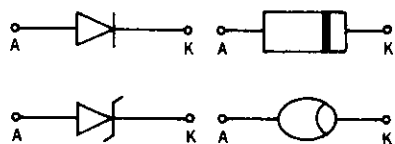


Check-3

● How to check diode (D)

- Set the tester to terminal A \oplus side (anode) and K \ominus side (cathode) of diode as follows to check for conduction.

Then the requirements in the table should be satisfied.

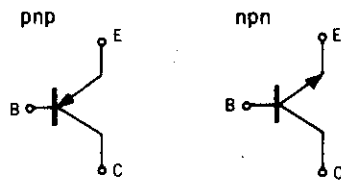


Table

Measurement	Tester probes (red \oplus , black \ominus) and indicator deflection	
A \oplus	\oplus of tester	Does not deflect.
K \ominus	\ominus of tester	
A \oplus	\ominus of tester	Deflects.
K \ominus	\oplus of tester	

Check-4

• How to check transistor (Q)



- Set the tester to terminal B (base), E (emitter) and C (collector) of transistor to check for conduction.

Then the following should be satisfied.

Table-1 (pnp)

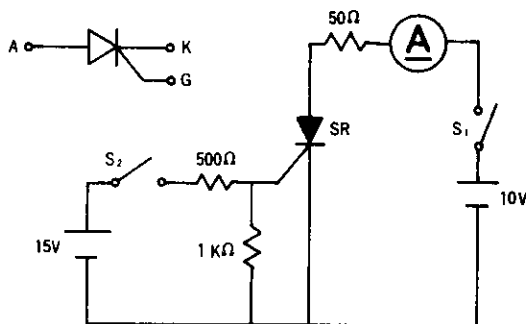
Measurement	B - C	B - C	B - E	B - E
Tester polarity	\oplus \ominus	\ominus \oplus	\oplus \ominus	\ominus \oplus
Tester deflection	Deflects	Does not deflect.	Deflects	Does not deflect.

Table-2 (npn)

Measurement	B - C	B - C	B - E	B - E
Tester polarity	\oplus \ominus	\ominus \oplus	\oplus \ominus	\ominus \oplus
Tester deflection	Deflects	Does not deflect.	Deflects	Does not deflect.

Check-5

• How to check thyristor (SR)



- Remove the thyristor from P.C board and check it on a circuit as shown below.

The SCR is acceptable if the following are satisfied.

	Circuit switch operation	Ammeter
1	Set SW 1 to ON.	Does not deflect.
2	Set SW 2 to ON also.	Deflects.
3	Set SW 2 to OFF.	Remains deflected.
4	Set SW 1 to OFF also.	Stops deflecting.

- Or check for conduction with A-K touched with tester. It is acceptable if there is no conduction.

Check-6

• How to check photo transistor (P.C)



- After discharging the main capacitor, set the tester to the photo transistor leads to check for conduction.

1. Connection

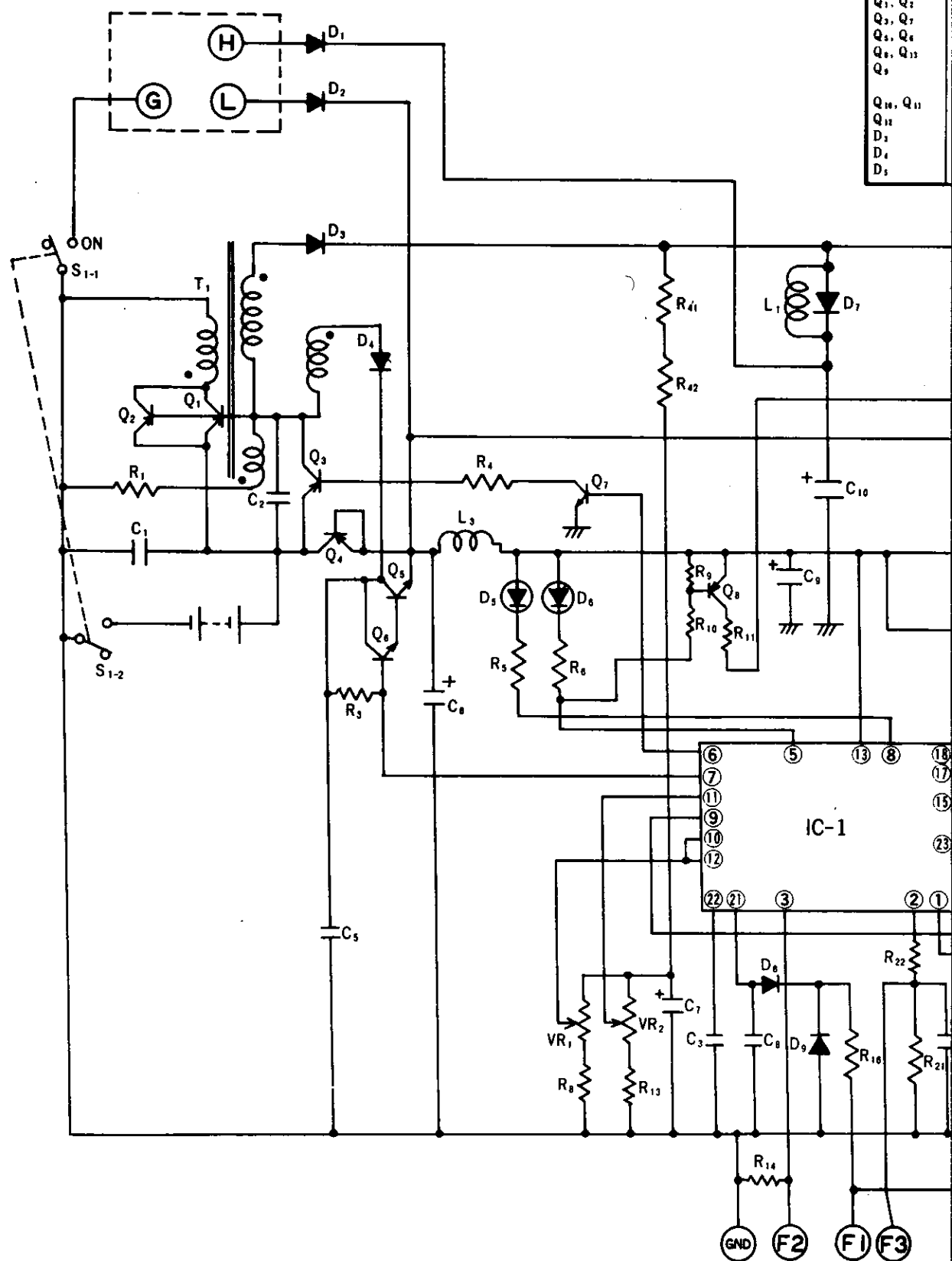
Tester \oplus	Photo transistor (E)
Tester \ominus	Photo transistor (C)

The following should be satisfied.

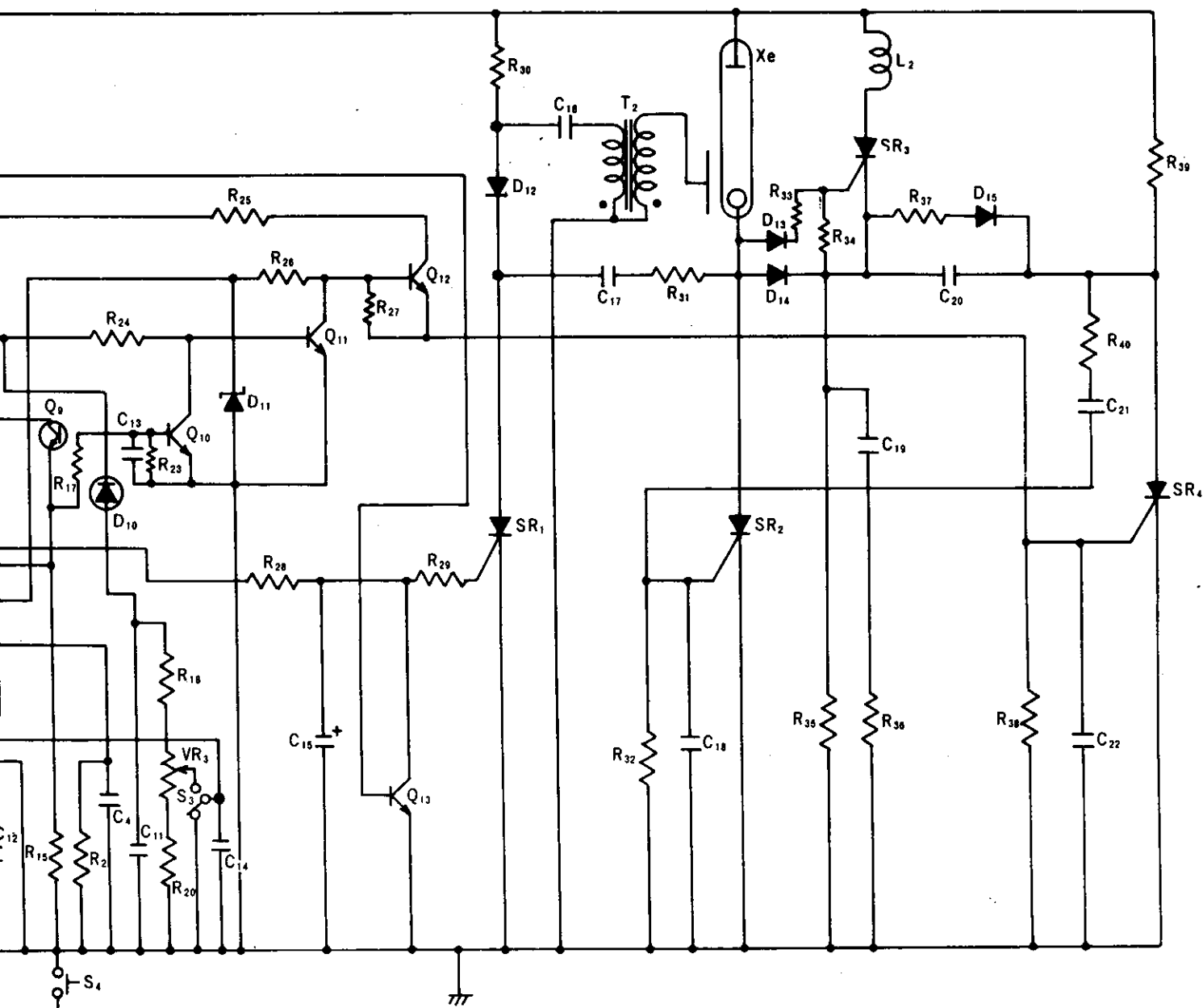
2. Conduction

Exposed to light	Indicator deflects.
With it shaded	Does not deflect.

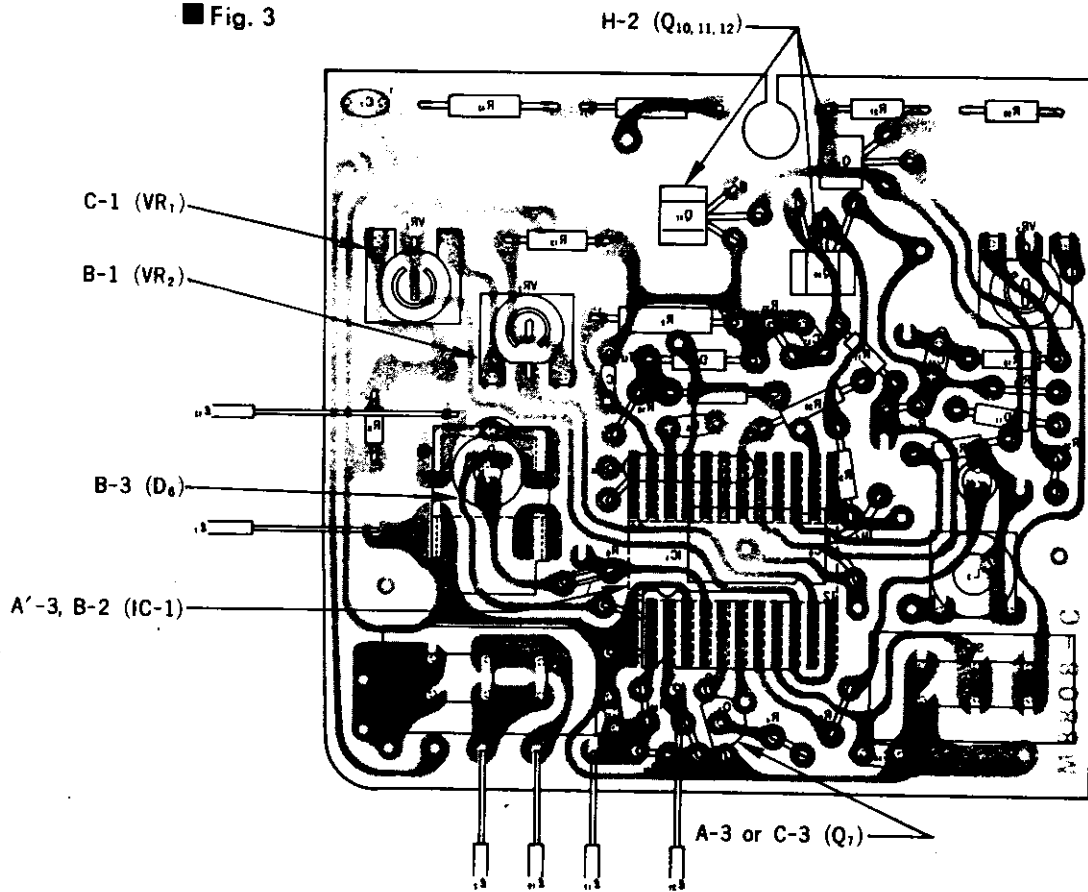
■ Circuit Diagram



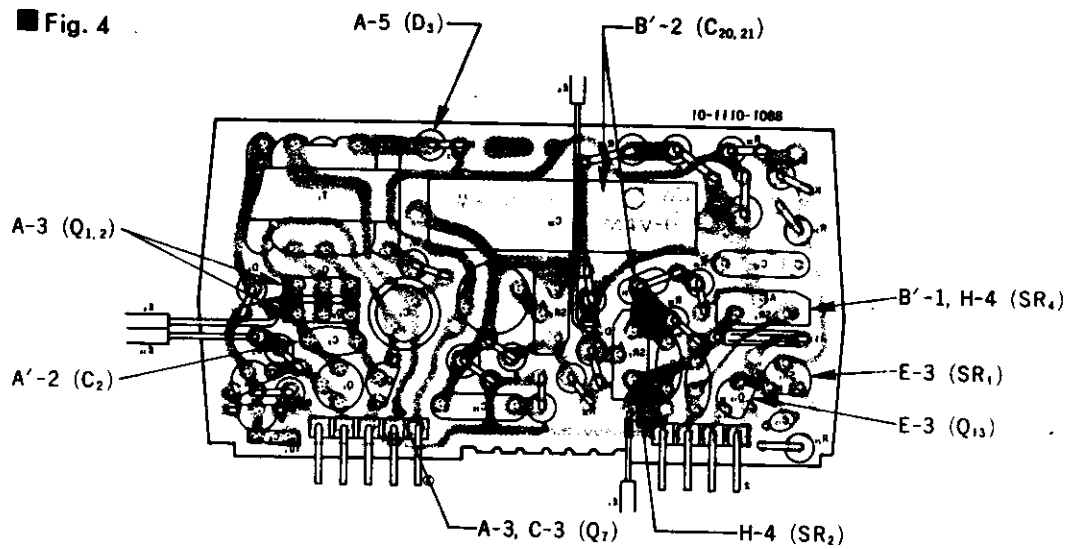
Function	Name	Function	Name	Function	Name	Function	Name	Function
Flashing tube	D ₆	Monitor lamp	R ₁₀ , R ₂₀	Voltage dividing	C ₄	IC-1 oscillation	VR ₁	Monitor circuit voltage setting
Current limiting	D ₇	Reverse voltage prevention	R ₂₁ , R ₂₂	IC-1 control	C ₅	Q ₅ , Q ₆ control	VR ₂	Monitor lamp voltage setting
Oscillation transformer	D ₈	For synchro circuit	R ₂₄	Q ₁ control	C ₆	Power supply	VR ₃	Lo GN setting
Trigger coil for Xe tube	D ₉	IC protection	R ₂₅	Current limiting	C ₇	Stabilization	S ₁₋₁	Switch for external power supply
Camera, strobe control	D ₁₀	Sensor for Lo light emission	R ₂₆ , R ₂₇	Q ₁₂ limiting	C ₈	Noise absorption	S ₁₋₂	Switch for internal power supply
Tube flashing	D ₁₁	IC protection	R ₂₈	SR ₁ control	C ₉	Power supply	S ₃	Lo-Hi changeover
Tube control	D ₁₂	Reverse current prevention	R ₂₉	SR ₁ control	C ₁₀	Main capacitor	S ₄	Individual flashing
-value correction at close distance	D ₁₃	C ₅ reverse current prevention	R ₃₀	Trigger circuit charging	C ₁₁	Stabilization		
R ₁ reverse biasing	R ₁	Q ₁ , Q ₂ biasing	R ₃₁ , R ₃₉	Current limiting	C ₁₂	Noise absorption		
Converter circuit oscillation	R ₂	IC oscillation	R ₃₂	SR ₂ control	C ₁₃	Q ₁₀ control		
Q ₁ , Q ₂ control	R ₃	Q ₈ control	R ₃₃ , R ₃₄	SR ₃ control	C ₁₄	Stabilization		
Power backup	R ₄	Q ₃ control	R ₃₅	C ₂₀ charging	C ₁₅	SR ₁ control		
R ₁ faulty operation prevention	R ₅ , R ₆	LED current limiting	R ₃₆	C ₁₃ voltage control	C ₁₆	For trigger		
Photo transistor for light	R ₇	Voltage dividing	R ₃₇	C ₂₄ discharging circuit	C ₁₇	Double voltage generation		
Mission monitor	R ₈	Q ₄ control	R ₃₈	SR ₄ control	C ₁₈	Stabilization		
R ₁ control	R ₉ , R ₁₀ , R ₁₁	Voltage dividing	R ₄₀	SR ₂ control	C ₁₉	Stabilization		
R ₄ control	R ₁₂	Signal output			C ₂₀	Potential control during charging	Q ₄	IC power supply
High voltage rectification	R ₁₃	Voltage generation			C ₂₁	Commutation	D ₁	High voltage rectification
Supply voltage smoothing	R ₁₄	Current limiting			C ₂₂	SR ₂ control	D ₂	IC power supply
DC lamp	R _{17,23}	Q ₁₀ control						



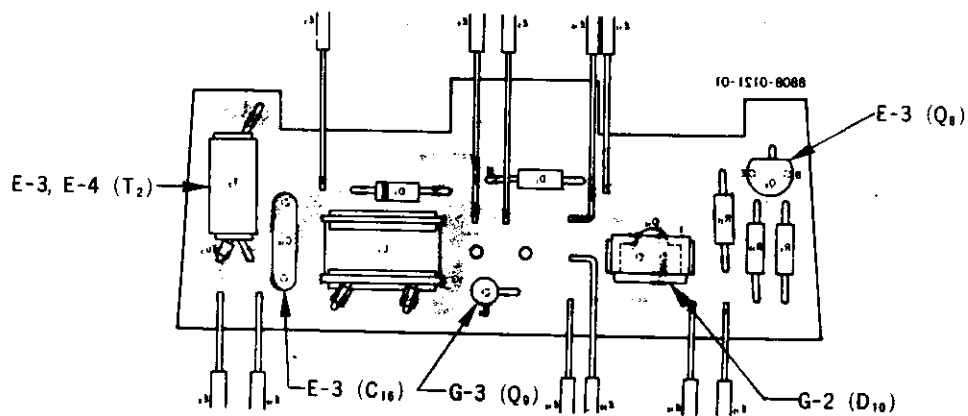
■ Fig. 3



■ Fig. 4

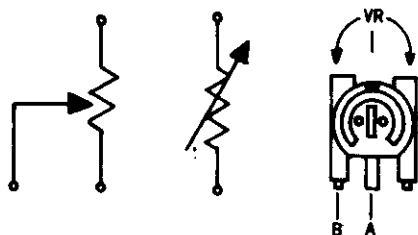


■ Fig. 5



Check-7

How to check semi-fixed resistor (VR)



- Remove the semi-fixed resistor from P.C board and set the tester to terminals **A** and **B**. Resistance value should change smoothly with VR turned.

Check Point

Fig. 1

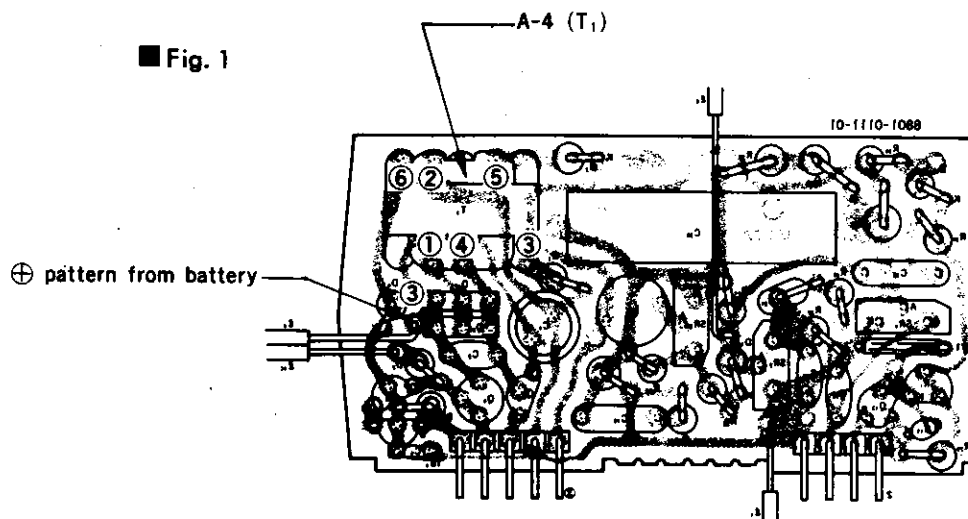
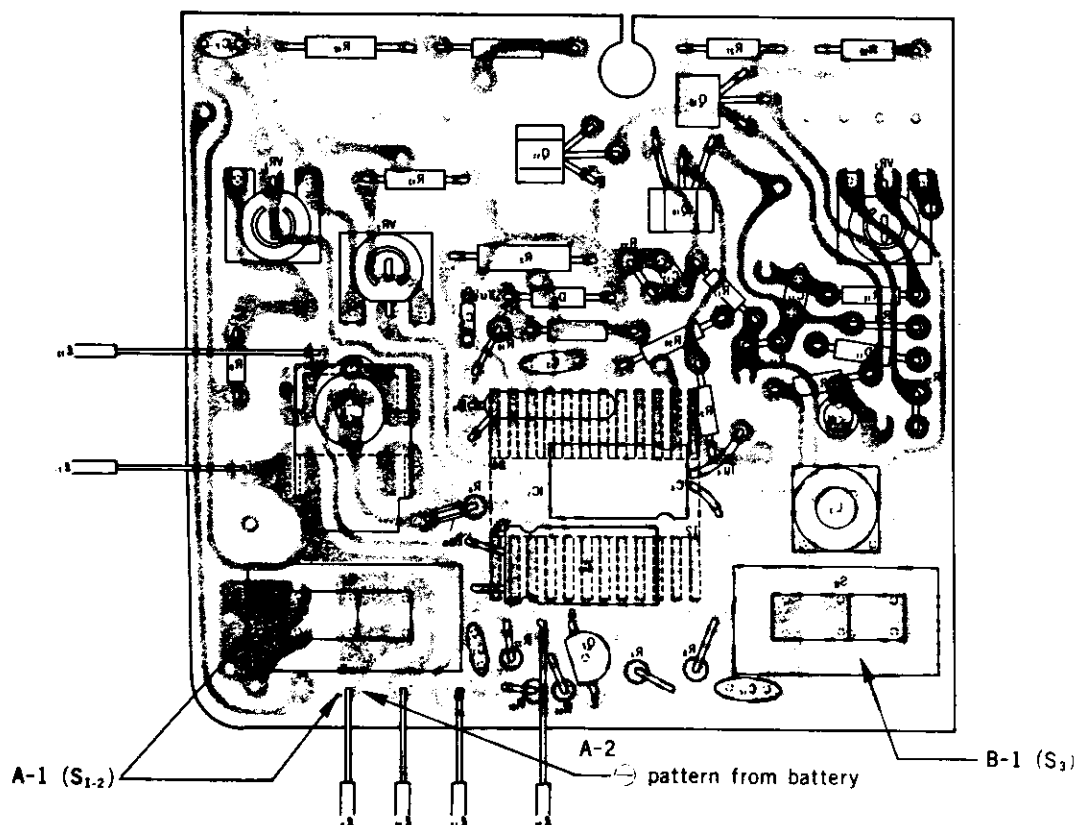
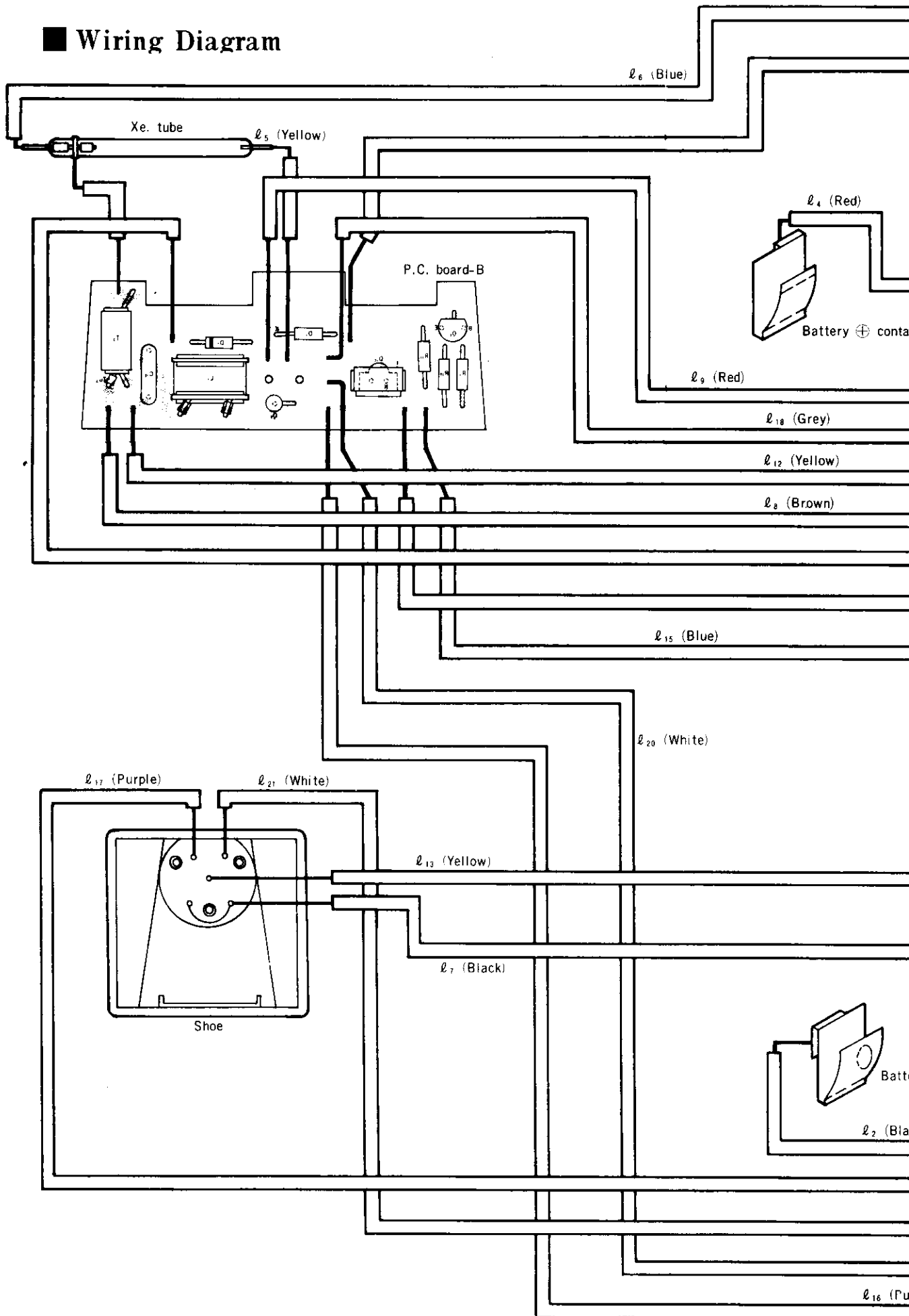
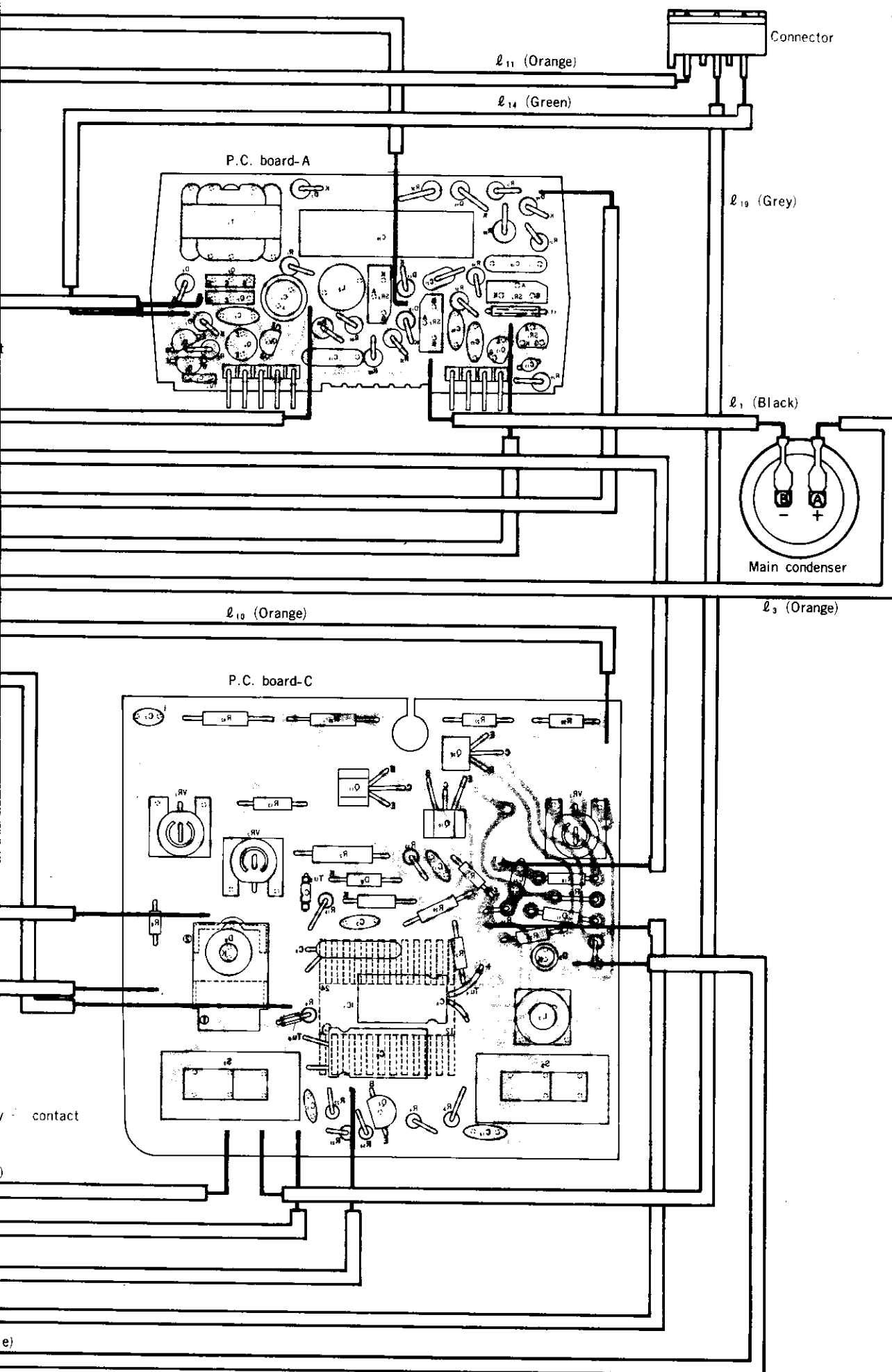


Fig. 2



■ Wiring Diagram





AUTO ELECTROFLASH 360PX (8810)

Type

Programmed/auto/manual clip-on electronic flash.

Auto circuitry.....Thyritor

Guide number (ASA/ISO 100.m)

- 6.4~25 when using Wideangle diffuser (28mm)
- Variable GN/power control with 9 positions from FULL to 1/16 (GN 9) at 0.5 EV intervals.

① Film speed (ASA/ISO)

② Guide number (using each diffusers)

①	②				25	50	64	100	160	200	400
	T	W ₂	W ₁	Normal							
Full					25	36	40	51	64	72	100
•					21	30	34	43	54	61	86
1/2				Full	18	25	29	36	45	51	72
•				•	15	21	24	30	38	43	61
1/4			Full	1/2	13	18	20	25	31	36	51
•			•	•	11	15	17	21	26	30	43
1/8	Full	1/2	1/4		9.0	13	14	18	23	25	36
•	•	•	•		7.6	11	12	15	19	21	30
1/16	1/2	1/4	1/8		6.4	9.0	10	13	16	18	25
•	•	•	•		5.4	7.6	8.7	11	14	15	21
	1/4	1/8	1/16		4.5	6.4	7.1	9.0	11	13	18
•	•	•			3.8	5.4	6.0	7.6	9.6	11	15
	1/8	1/16			3.2	4.5	5.0	6.4	8.1	9.0	13
•	•				2.7	3.8	4.3	5.4	6.8	7.6	11
	1/16				2.3	3.2	3.6	4.5	5.7	6.4	9.0

Auto working range (ASA/ISO 100)

- Programmed TTL Auto (with f:1.4 50mm lens)

P mode.....0.7~8m

A mode.....0.06~25m

- Sensor Auto

f:2.8.....0.7~13m

f:5.6.....0.35~6.4m

f:11.....0.18~3.2m

① Guide number ② Film speed(ASA/ISO) ③ Mode

③ \ ②		Full	1/2	1/4	1/8	1/16
P mode	25	0.35~4	0.35~2.8	0.35~2	0.35~1.4	0.35~1
	100	0.7~8	0.7~5.6	0.7~4	0.7~2.8	0.7~2
	400	1.4~16	1.4~11	1.4~8	1.4~5.6	1.4~4
A mode (F1.4)	25	0.35~13	0.35~9	0.35~6.4	0.35~4.5	0.35~3.2
	100	0.7~25	0.7~18	0.7~13	0.7~9	0.7~6.4
	400	1.4~50	1.4~36	1.4~25	1.4~18	1.4~13
(F5.6)	25	0.18~3.2	0.18~2.2	0.18~1.6	0.18~1.1	0.18~0.8
	100	0.35~6.4	0.35~4.5	0.35~3.2	0.35~2.2	0.35~1.6
	400	0.7~13	0.7~9	0.7~6.4	0.7~4.5	0.7~3.2

Recycle time (sec.)

③ \ ②	Manual		Programmed TTL Auto		Sensor Auto	
	Alkaline-manganese	Ni-Cd	Alkaline-manganese	Ni-Cd	Alkaline-manganese	Ni-Cd
Full	10	6	0.4~10	0.2~6	0.4~10	0.2~6
1/2	4	2	0.4~4	0.2~2	0.4~4	0.2~2
1/4	1.8	1	0.8~1.8	0.2~1	0.4~1.8	0.2~1
1/8	1.2	0.6	0.4~1.2	0.2~0.6	0.4~1.2	0.2~0.6
1/16	0.8	0.4	0.4~0.8	0.2~0.4	0.4~0.8	0.2~0.4



Number of flashes

① Mode ② Battery ③ Guide number

③	②	Manual		Programmed TTL Auto		Sensor Auto	
		Alkaline-manganese	Ni-Cd	Alkaline-manganese	Ni-Cd	Alkaline-manganese	Ni-Cd
	Full	100	50	100~2500	50~1000	100~2000	50~700
	1/2	250	100	250~2500	100~1000	250~2000	100~700
	1/4	450	180	450~2500	180~1000	450~2000	180~700
	1/8	700	250	700~2500	250~1000	700~2000	250~700
	1/16	1000	350	1000~2500	350~1000	1000~2000	350~700

Flash coverage

For lenses down to 35mm focal length.

Vertical: 45

Horizontal: 60

Motor drive/winder interlocking

① Power source of 360PX ② GN changeover ③ External power source

<div>①</div> <div>③</div> <div>②</div>		Ni-Cd			Alkaline-manganese			No Battery 360PX		
		$\frac{1}{6}$	•	$\frac{1}{6}$	$\frac{1}{6}$	•	$\frac{1}{6}$	$\frac{1}{6}$	•	$\frac{1}{6}$
No external power source (Only 360PX)		○								
Power Grip 2	Ni-Cd Battery Pack NP-2	⊗	⊗	○	⊗	○	○	⊗	○	○
	AA-size NiCd	⊗	⊗	○	⊗	○	○	○	○	
	Alkaline-manganese	○	○		○					
	Sealed carbon-zinc	○	○							
AC Adapter 4		○								

○..... 2 fps
 ⊗..... 3.5 fps } Providing multitudinous firing (more than 40 flashes)

Automatic power OFF

Energy-saving circuit automatically turns unit off after approx. 15 min. if not fired.

Others

- Direct Autoflash Measuring System
- FDC (Flash Distance Check)
- TTL indication (Green TTL lamp comes on when mode selector is at TTL.)
- Red LED indication of aperture setting when mode selector is at Sensor Auto setting.
- Computer dial (which is illuminated by Dial-light-button pushing.)
- External power input
- Cable-FB terminal
- Sync cord terminal
- Accessory terminal
- Test button

Dimensions (W×D×H)

76×85×125 (3×3-3/8×4-15/16 in.)

Weight

395g (14-1/8 oz.) without batteries.

SERVICE MANUAL SUPPLEMENTARY INFORMATION

Model AUTO ELECTROFLASH 360PX

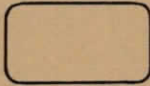


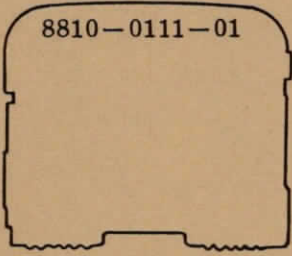
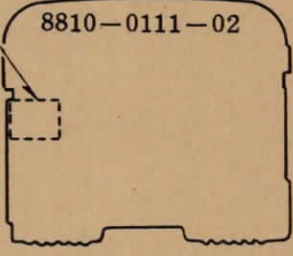


Code No. 8810

■ PC board modifications

■ The PC board-A set, -B set have been modified as table below.

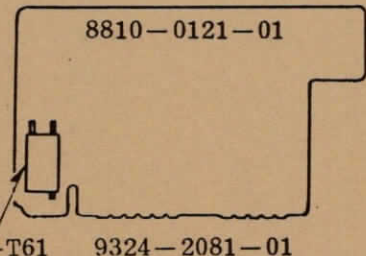


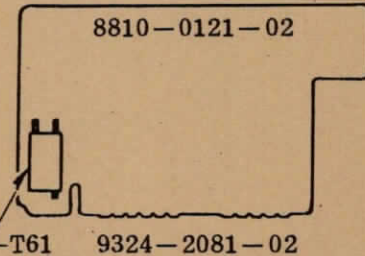
■ Modification details

① By the PC board-H set discontinuance.

Previous type	Interchangeability	New type
PC board-H set  8810-0161-01	 ※ 1 	Discon
PC board-A set  8810-0111-01		Electrical parts of PC board-H set  8810-0111-02 •Refer to page 2.
Lead wires 011, 039, 046, 051, 057	 ※ 2 	Discon •Refer to page 3.

※ 1 When replacing the PC board-A set with the new type one (8810-0111-02), remove the PC board-H set, install 8810-0111-02 and perform the wiring.

② Stabilizing of guide number at Lo settings (other than FULL setting).

Previous type	Interchangeability	New type
PC board-B set  8810-0121-01 T61 9324-2081-01 Type.NC-850	 ※ 2 	 8810-0121-02 T61 9324-2081-02 Type.JN-900

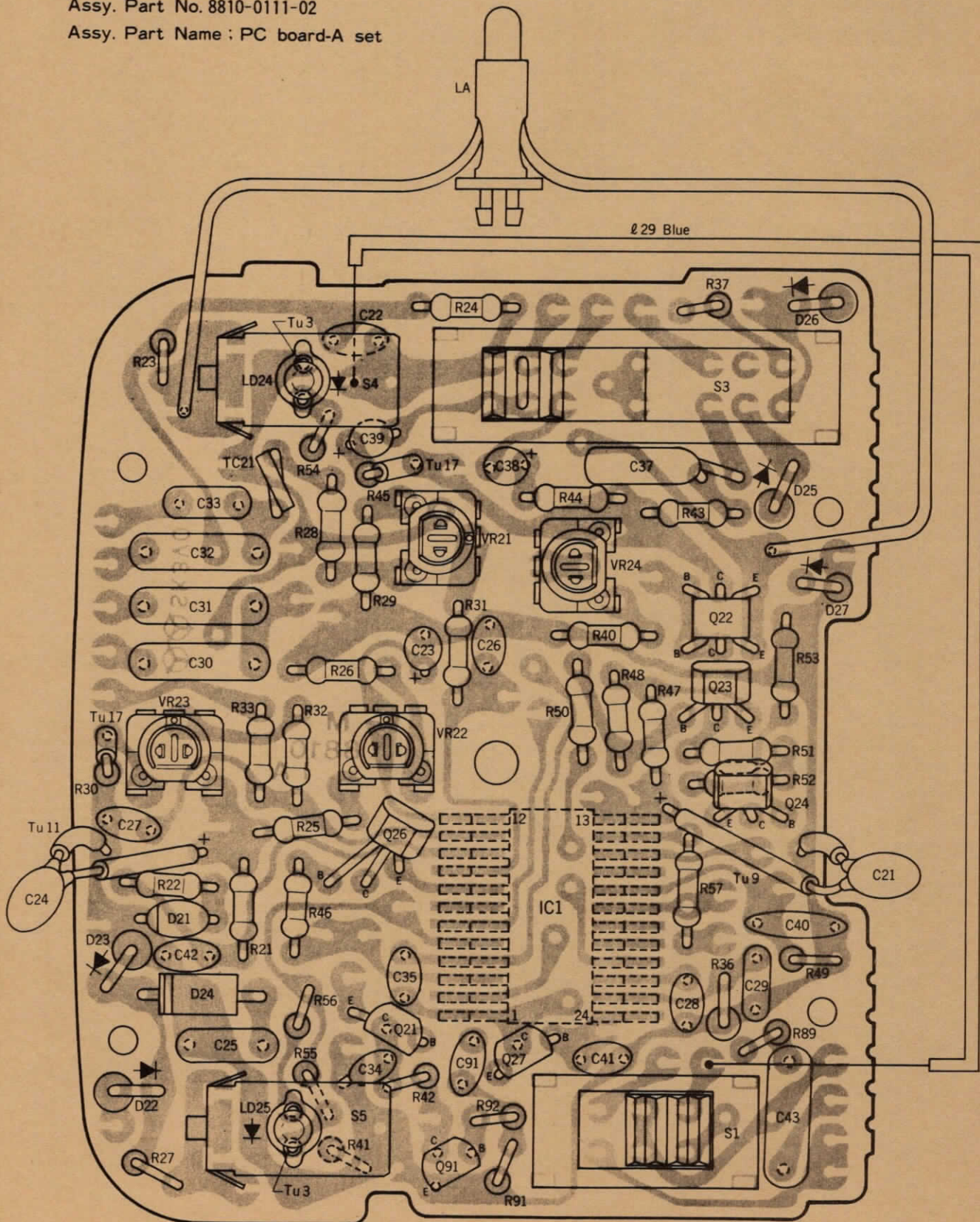
※ 2 Previous type can be replaced by the new type one, however, the converse is not allowed.

AUTO ELECTRO FLASH 360PX

CODE No. 8810

Assy. Part No. 8810-0111-02

Assy. Part Name : PC board-A set



Assy. Part No. 8810-0111-02

Assy. Part Name P.C.board - A set
プリント基板Aセット

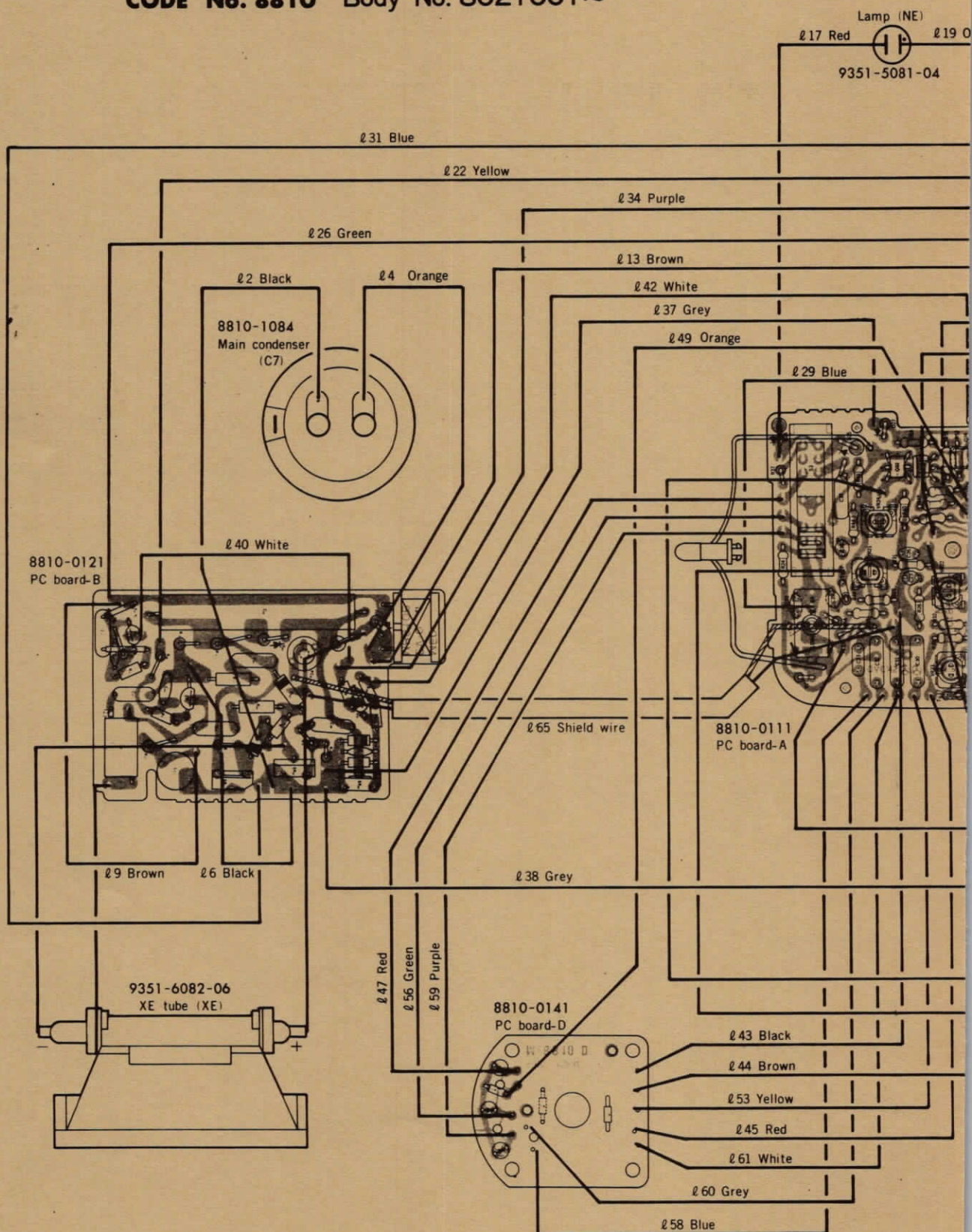
Symbol	Part No.	Com.	Part Name	Typ.	Qty.
IC1	9360-0080-04		I C	M54415P	1
LD24	9353-2081-02		L E D	LN38GP	1
LD25	9353-2081-01			LN-28RP	1
D21	9361-5081-02		Varistor	KB-269	1
D22 D23 D24	9361-2082-02		Diode	10D-8	} 5
D25 D26	9361-2087-01			IN4006	
D27	9361-4081-05		Zenner diode	MZ-303	1
Q21	9363-4085-01		Transistor	2SB808	1
Q22	9363-1085-01			2SA1237	1
Q23 Q27	9363-1082-01			2SA1115	2
Q24 Q26 Q91	9362-1082-01			2SC2603	3
R21 R48 R50	9422-2236-80		Fixed resistor	1/8W 22K Ω	3
R22	9422-4725-80			1/8W 4.7K Ω	1
R23 R37	9422-1046-80			1/8W 100K Ω	2
R24	9422-3356-80			1/8W 3.3M Ω	1
R25	9422-1536-80			1/8W 15K Ω	1
R26	9422-3936-80			1/8W 39K Ω	1
R27 R89	9422-4706-80			1/8W 47 Ω	2
R28	9422-6836-80			1/8W 68K Ω	1
R29	9422-1546-80			1/8W 150K Ω	1
R30	9422-1236-80			1/8W 12K Ω	1
R31 R51	9422-1035-80			1/8W 10K Ω	2
R32	9422-1545-80			1/8W 150K Ω	1
R33	9422-1556-80			1/8W 1.5M Ω	1
R36	9423-5644-80			1/8W 560K Ω	1
R40	9422-8236-80			1/8W 82K Ω	1
R41	9422-2046-80			1/8W 200K Ω	1
R42	9422-5606-80			1/8W 56 Ω	1
R43	9422-3916-80			1/8W 390 Ω	1
R44	9422-6806-80			1/8W 68 Ω	1
R45	9422-2206-80			1/8W 22 Ω	1
R46	9422-4736-80			1/8W 47K Ω	1
R47 R92	9422-1026-80			1/8W 1K Ω	2
R49 R56 R57	9422-1036-80			1/8W 10K Ω	3
R52	9422-8225-80			1/8W 8.2K Ω	1
R53	9422-5635-80			1/8W 56K Ω	1
R54	9422-2716-80			1/8W 270 Ω	1
R55	9422-3316-80			1/8W 330 Ω	1
R91	9422-3926-80			1/8W 3.9K Ω	1
VR21	9462-2049-80		Variable resistor	0.1W 200K Ω	1
VR22 VR23	9462-2039-80			0.1W 20K Ω	2
VR24	9462-5039-80			0.1W 50K Ω	1
TC21	9368-2083-02		Thermistor	TD5-C310D2	1
LA	8810-0142-01		Lamp	ML-5X60	1
S1	9333-2082-04		Switch	SKM-22-03BP	1
S3	9333-2082-05			SKM-26-045BP	1
S4 S5	8805-1014-01		Open flash contact		2

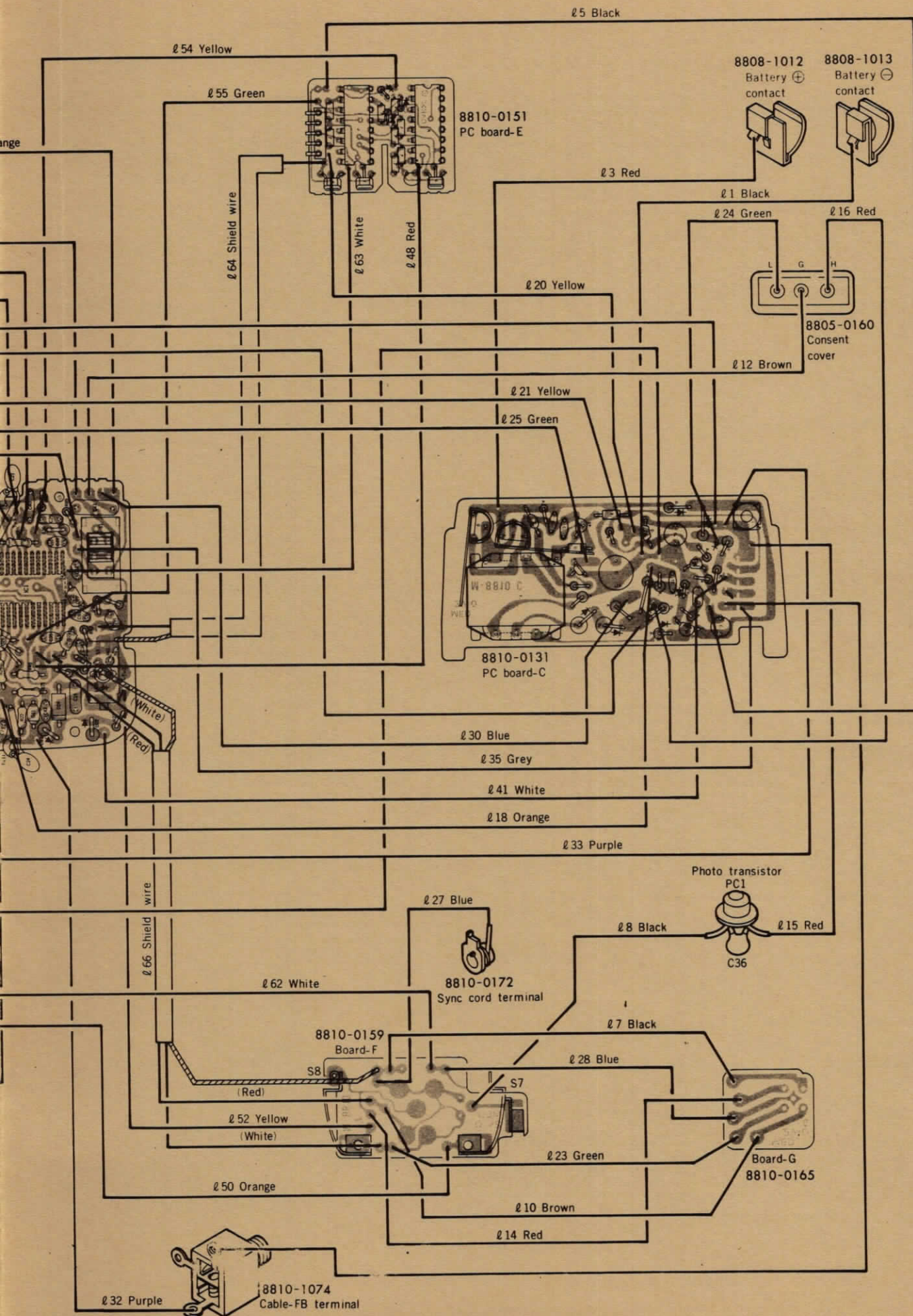
Symbol	Part No.	Com.	Part Name	Typ.	Qty.
C21	9532-1065-80		Tantalum	10 μ F/10V	1
C22 C27 C42 C91	9564-1035-86		Ceramic	0.01 μ F/25V	4
C23	9535-1055-80		Tantalum	1 μ F/35V	1
C24	9532-3355-80			3.3 μ F/10V	1
C25	9545-6833-80		Plastic	0.068 μ F/50V	1
C26	9565-1015-86		Ceramic	100PF/50V	1
C28 C41	9564-4725-86			4700PF/25V	2
C29	9595-1023-81		Mylar	1000PF/50V	1
C30	9548-1544-82			0.15 μ F/350V	1
C31 C37	9548-8234-82		Plastic	0.082 μ F/350V	2
C32	9548-3934-82			0.039 μ F/350V	1
C33	9595-1533-81		Mylar	0.015 μ F/50V	1
C34 C35	9565-1025-86		Ceramic	1000PF/50V	2
C38	9535-3344-80		Tantalum	0.33 μ F/35V	1
C39	9534-1554-80			1.5 μ F/25V	1
C40	9563-1045-86		Ceramic	0.1 μ F/12V	1
C43	9548-1045-82		Plastic	0.1 μ F/350V	1
* \varnothing 29	9393-2805-06		Lead wire Blue	UL 1571 AWG28 ℓ =90	1
Tu3	9384-2905-01		Tube	ϕ 0.65 ℓ =7	4
Tu9	9384-2907-01			ϕ 0.65 ℓ =10	2
Tu11	9384-2907-01			ϕ 0.65 ℓ =13	2
Tu17	9384-2907-01			ϕ 0.65 ℓ =5	2

Marked (*) lead wires must be ordered in length rounded to nearest meter.
 上記リード線の供給単位は、1m単位です。

WIRING SCHEMATIC DIAGRAM [II]

CODE No. 8810 Body No. 8021001 ~





Lead wires list

Symbol	Part No.	Color	Typ.	Qty.
ℓ 1	9393-2601-00	Black	UL1007 AWG26 ℓ =120	1
ℓ 2	9393-2601-00	Black	UL1007 AWG26 ℓ =150	1
ℓ 3	9393-2601-02	Red	UL1007 AWG26 ℓ =130	1
ℓ 4	9393-2601-03	Orange	UL1007 AWG26 ℓ =140	1
ℓ 5	9393-2805-00	Black	UL1571 AWG28 ℓ =40	1
ℓ 6	9393-2805-00	Black	UL1571 AWG28 ℓ =50	1
ℓ 7	9393-2805-00	Black	UL1571 AWG28 ℓ =70	1
ℓ 8	9393-2805-00	Black	UL1571 AWG28 ℓ =140	1
ℓ 9	9393-2805-01	Brown	UL1571 AWG28 ℓ =50	1
ℓ 10	9393-2805-01	Brown	UL1571 AWG28 ℓ =70	1
ℓ 12	9393-2805-01	Brown	UL1571 AWG28 ℓ =100	1
ℓ 13	9393-2805-01	Brown	UL1571 AWG28 ℓ =285	1
ℓ 14	9393-2805-02	Red	UL1571 AWG28 ℓ =70	1
ℓ 16, ℓ 15	9393-2805-02	Red	UL1571 AWG28 ℓ =100	2
ℓ 17	9393-2805-02	Red	UL1571 AWG28 ℓ =170	1
ℓ 18	9393-2805-03	Orange	UL1571 AWG28 ℓ =90	1
ℓ 19	9393-2805-03	Orange	UL1571 AWG28 ℓ =130	1
ℓ 20	9393-2805-04	Yellow	UL1571 AWG28 ℓ =90	1
ℓ 21	9393-2805-04	Yellow	UL1571 AWG28 ℓ =140	1
ℓ 22	9393-2805-04	Yellow	UL1571 AWG28 ℓ =200	1
ℓ 23	9393-2805-05	Green	UL1571 AWG28 ℓ =70	1
ℓ 24	9393-2805-05	Green	UL1571 AWG28 ℓ =120	1
ℓ 25	9393-2805-05	Green	UL1571 AWG28 ℓ =130	1
ℓ 26	9393-2805-05	Green	UL1571 AWG28 ℓ =320	1
ℓ 27	9393-2805-06	Blue	UL1571 AWG28 ℓ =40	1
ℓ 28	9393-2805-06	Blue	UL1571 AWG28 ℓ =70	1
ℓ 29	9393-2805-06	Blue	UL1571 AWG28 ℓ =90	1
ℓ 30	9393-2805-06	Blue	UL1571 AWG28 ℓ =145	1
ℓ 31	9393-2805-06	Blue	UL1571 AWG28 ℓ =190	1
ℓ 32	9393-2805-07	Purple	UL1571 AWG28 ℓ =80	1
ℓ 33	9393-2805-07	Purple	UL1571 AWG28 ℓ =110	1
ℓ 34	9393-2805-07	Purple	UL1571 AWG28 ℓ =165	1
ℓ 36, ℓ 35	9393-2805-08	Grey	UL1571 AWG28 ℓ =120	2
ℓ 37	9393-2805-08	Grey	UL1571 AWG28 ℓ =190	1
ℓ 38	9393-2805-08	Grey	UL1571 AWG28 ℓ =280	1
ℓ 40	9393-2805-09	White	UL1571 AWG28 ℓ =60	1
ℓ 41	9393-2805-09	White	UL1571 AWG28 ℓ =100	1
ℓ 42	9393-2805-09	White	UL1571 AWG28 ℓ =160	1
ℓ 43	9393-3005-00	Black	UL1571 AWG30 ℓ =95	1
ℓ 44	9393-3005-01	Brown	UL1571 AWG30 ℓ =100	1
ℓ 45	9393-3005-02	Red	UL1571 AWG30 ℓ =95	1
ℓ 48, ℓ 47	9393-3005-02	Red	UL1571 AWG30 ℓ =135	2
ℓ 50, ℓ 49	9393-3005-03	Orange	UL1571 AWG30 ℓ =120	2

Lead wires list

Symbol	Part No.	Color	Typ.	Qty.
ℓ 52	9393-3005-04	Yellow	UL1571 AWG30 ℓ =90	1
ℓ 53	9393-3005-04	Yellow	UL1571 AWG30 ℓ =95	1
ℓ 54	9393-3005-04	Yellow	UL1571 AWG30 ℓ =145	1
ℓ 55	9393-3005-05	Green	UL1571 AWG30 ℓ =95	1
ℓ 56	9393-3005-05	Green	UL1571 AWG30 ℓ =130	1
ℓ 58	9393-3005-06	Blue	UL1571 AWG30 ℓ =100	1
ℓ 59	9393-3005-07	Purple	UL1571 AWG30 ℓ =130	1
ℓ 60	9393-3005-08	Grey	UL1571 AWG30 ℓ =100	1
ℓ 61	9393-3005-09	White	UL1571 AWG30 ℓ =90	1
ℓ 62	9393-3005-09	White	UL1571 AWG30 ℓ =110	1
ℓ 63	9393-3005-09	White	UL1571 AWG30 ℓ =135	1
ℓ 64	9393-3003-00	Black	UL1354 AWG30 ℓ =130	1
ℓ 65	9393-3003-00	Black	UL1354 AWG30 ℓ =240	1
ℓ 66	8810-1086-01	Grey	UL2851 AWG32 ℓ =130	1

Above lead wires must be ordered in lengths rounded to nearest meter.

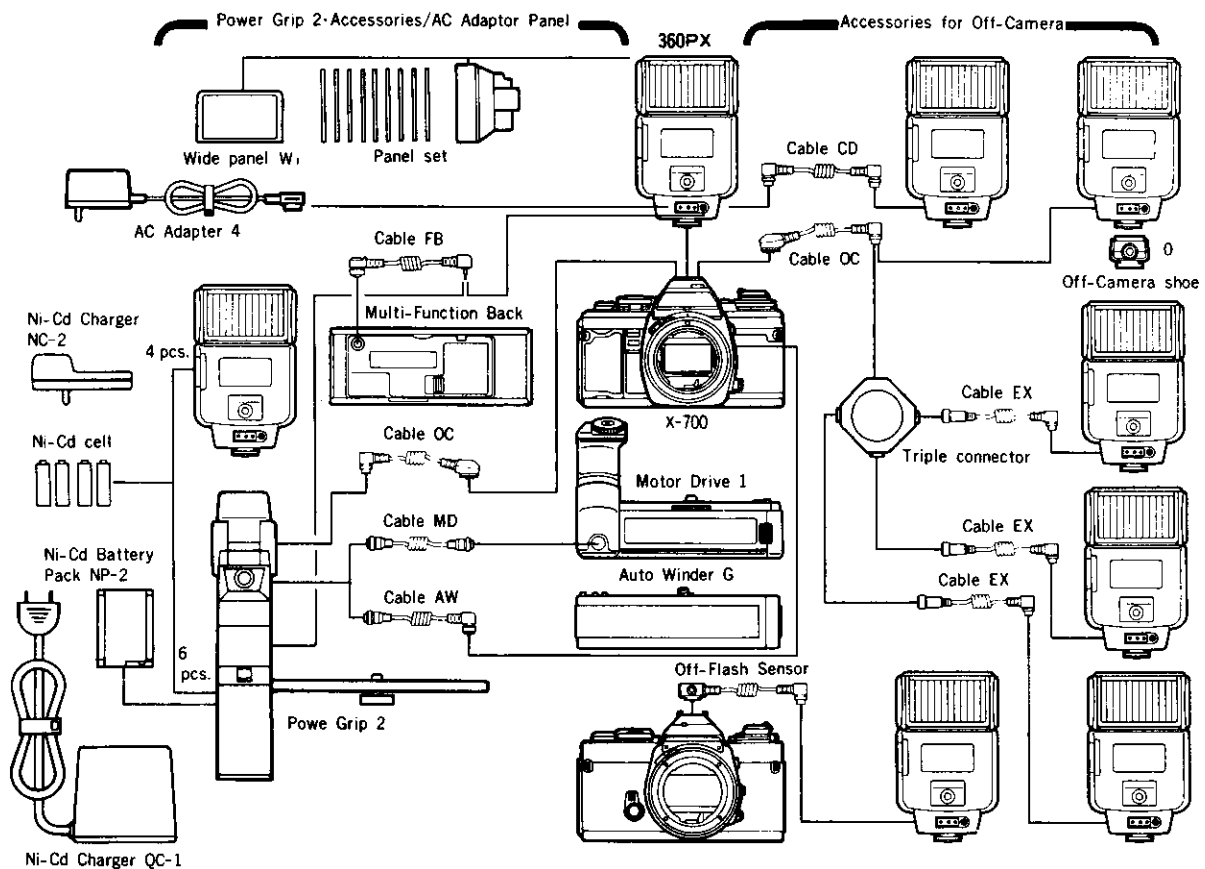
上記リード線の供給は、1m単位とします。

INDEX OF DESCRIPTION

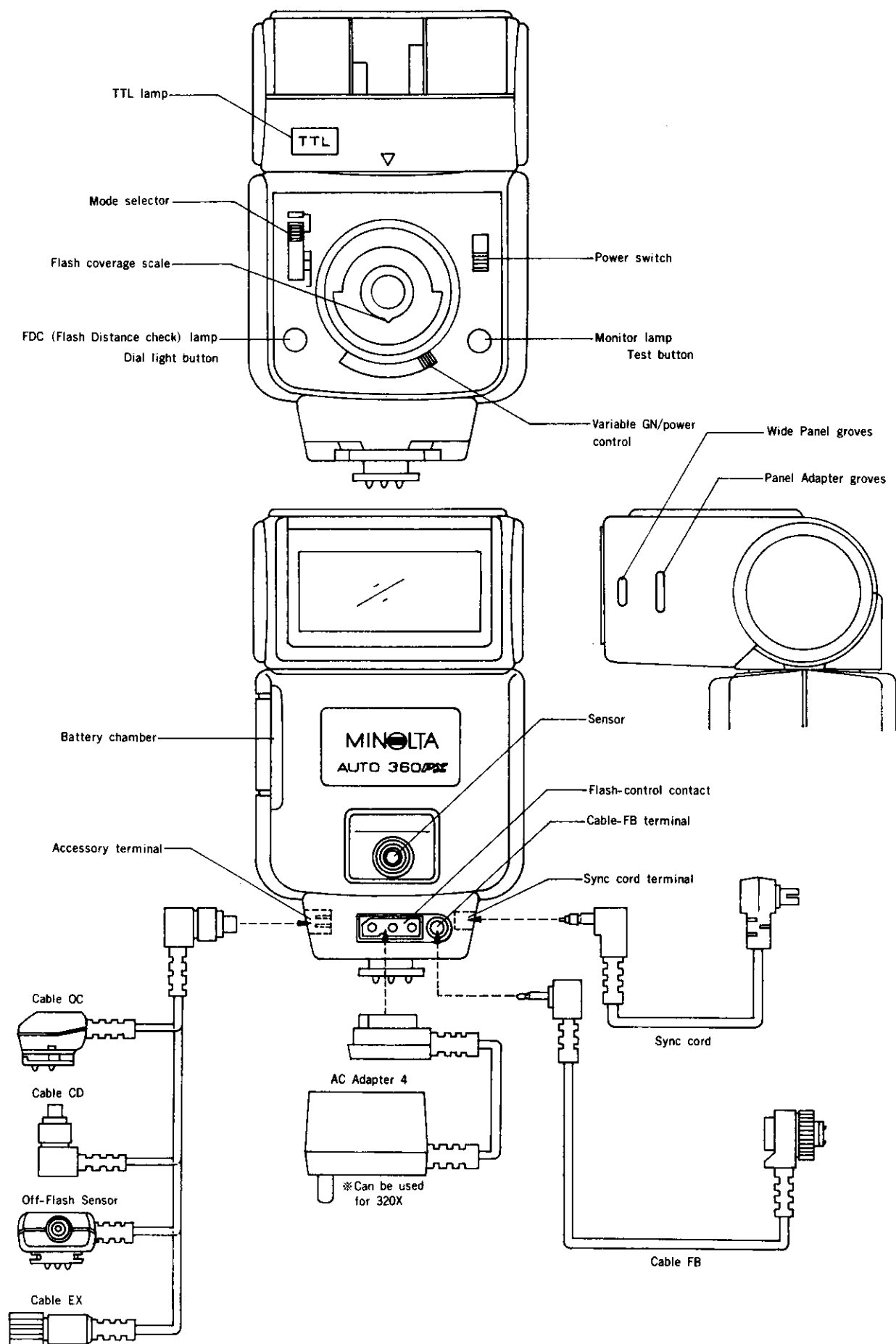
■ Names of Parts	P. 1
■ Block description	P. 2
■ Name/Function	P. 3
■ Circuit Diagram	P. 4

[System Chart]

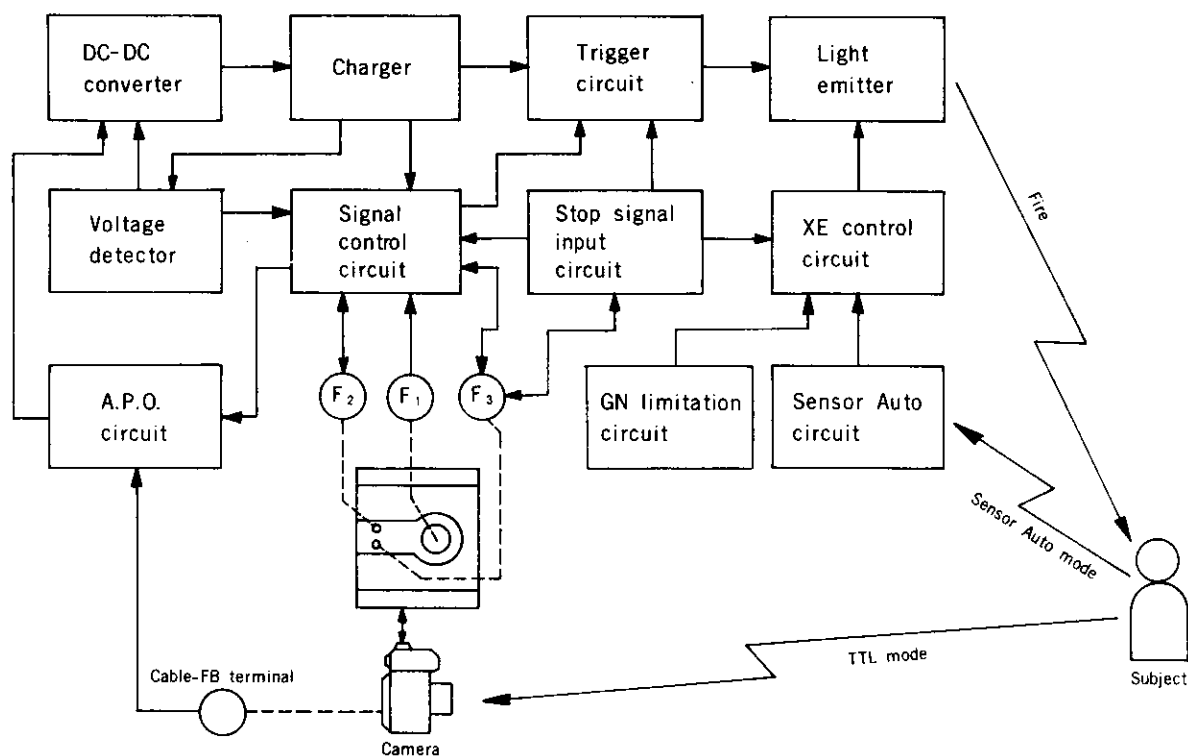
AUTO ELECTRO FLASH 360PX System Chart



Names of Parts



■ Block description



■ Block description

1. Battery power is converted by the DC-DC converter to high-tension current to the charger.
2. When the voltage of charger reaches the pre-determined level (approx. 285 V), monitor lamp lights up, Signal control circuit operates causing delivering of the signal to F_2 . By this signal, shutter speed of the camera is changed to "X" automatically, flash ready viewfinder signal is indicated, P flash signal is delivered from F_3 .
3. When the voltage of the charger reaches the pre-determined level, the voltage detector functions to stop the operation of the DC-DC converter. This makes the charger voltage constant (Monitor circuit).
4. With the camera shutter released, the X signal from F_1 enters the control signal output circuit, and the XE light-emitting signal is input to the trigger circuit. This signal causes the trigger circuit to function for XE emission.
In case of that camera setting is in P mode.....Aperture setting is automatically.
In case of that camera setting is in A mode.....Desired aperture turning diaphragm scale ring.
5. The camera light receiver receives light reflected from subject when the specified amount of exposure is reached, the stop signal is delivered from F_3 and it is delivered to stop signal input circuit. This signal stops the XE control circuit, which ceases light emission. At this time FDC lamp lights up, FDC signal is delivered to the camera, resulting in illuminating of viewfinder FDC indication.
6. After the main condenser has been charged, A.P.O circuit functions. Power supplying of 360PX automatically turns itself OFF if not fired within about 15 minutes after a full charge is reached, DC-DC converter function is stopped. After A.P.O circuit functions, power is supplied by reset of A.P.O circuit, resulting in DC-DC converter functions again.
7. When using limited GN by Variable GN/power control, GN limitation circuit functions, flash duration is controlled OFF when amount of flash light reaches to desired GN.
 - In Sensor Auto mode, sensor detects the reflected light from the subject, XE control circuit functions to control OFF the flash duration when detecting light reaches to specified amount. And FDC lamp lights them.
 - In Sensor Auto or M mode, electrical connection of F_3 is opened, resulting in no functioning of F_3 .

Name/Function

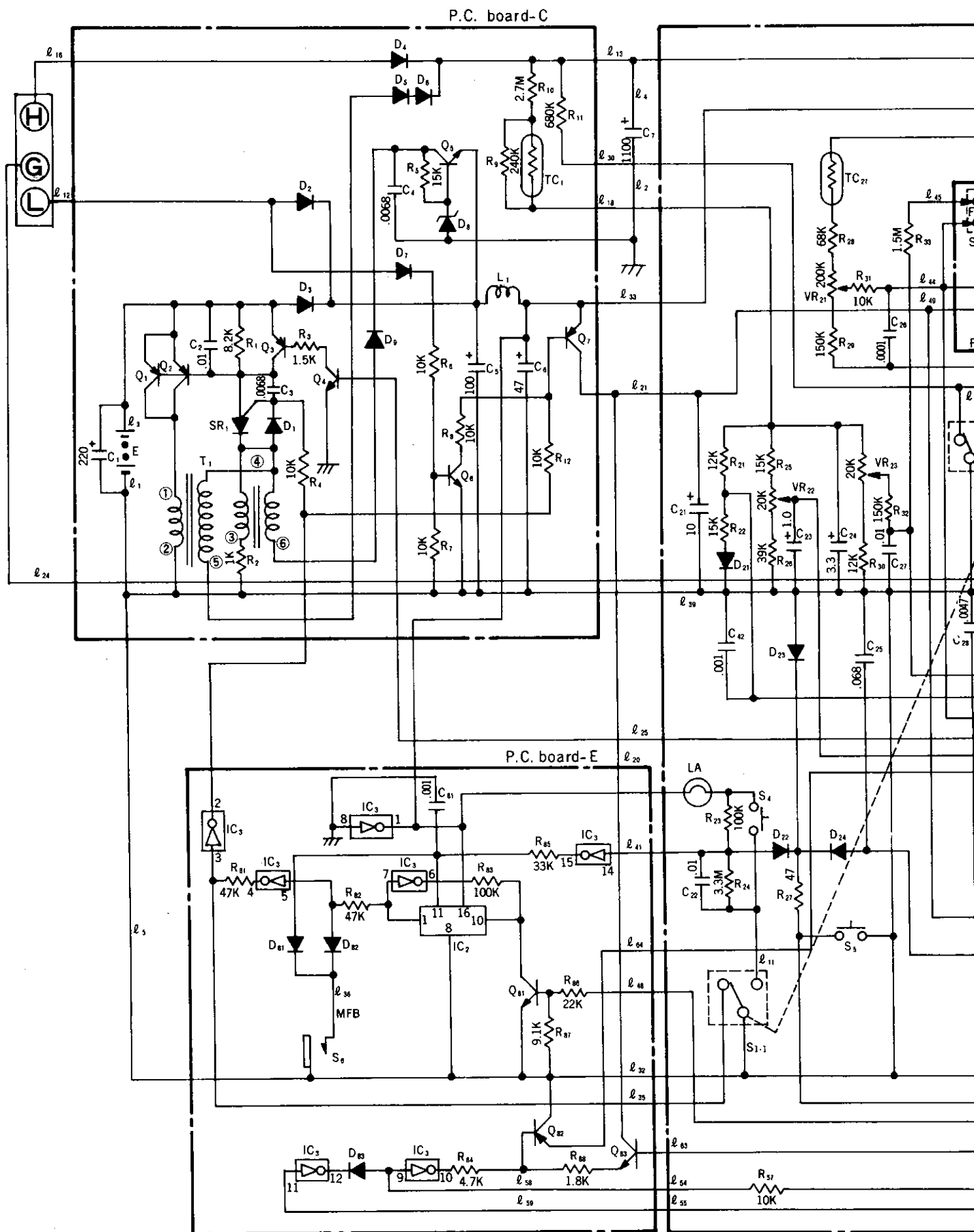
XE : Flashing tube	D ₉ : Rectifier for low voltage	R ₄₈ : Q ₂₃ control	C ₁ : For stabilization of battery voltage
L ₁ : Current limiting	D ₂₁ : For GN circuit	R ₄₉ : For stabilization	C ₂ : Bias (for Q ₁ /Q ₂)
L ₆₁ : Current limiting	D ₂₂ : For sync circuit	R ₅₀ : Q ₂₃ control	C ₃ : SR ₁ control
L ₆₂ : Current limiting	D ₂₃ : IC protection	R ₅₁ : Voltage division	C ₄ : Noise absorption (power source)
T ₁ : Trans for oscillation	D ₂₄ : For synchro circuit	R ₅₂ : Voltage division	C ₅ : Main capacitor
T ₆₁ : Trigger coil for XE tube	D ₂₅ : Counter-flow prevention	R ₅₃ : Voltage division	C ₂₁ : Noise absorption (power source)
NE : TTL lamp	D ₂₆ : Reverse voltage prevention	R ₅₄ : LD ₂₄ current limiting	C ₂₂ : Stabilization
LA : Illumination lamp of computer dial	D ₃₁ : Counter-flow prevention	R ₅₅ : LD ₂₅ current limiting	C ₂₃ : Noise absorption
S ₁₋₁ : Power switch	D ₃₂ : Counter-flow prevention	R ₅₆ : Prevention against SR ₆₁ misoperation	C ₂₄ : For chattering absorption
S ₁₋₂ : Power switch	D ₃₃ : C ₆₄ discharge	R ₅₇ : Q ₅₁ control	C ₂₉ : For IC ₁ oscillation
S ₂ : Variable GN/power control	D ₃₄ : For SR ₆₄ gate	R ₅₈ : SR ₆₁ control	C ₃₀ : For integrating circuit
S ₃ : Mode selector	D ₃₅ : Counter-flow prevention	R ₅₉ : Q ₅₂ control	C ₃₁ : Stabilization
S ₄ : Dial light button	D ₄₁ : Counter-flow prevention	R ₆₀ : Q ₅₁ control	C ₃₂ : Noise absorption
S ₅ : Individual flashing	D ₄₂ : Counter-flow prevention	R ₆₁ : Current limiting	C ₃₃ : For integrating circuit
S ₆ : Cable-FB terminal	LD ₂₁ : For F-number indication	R ₆₂ : SR ₆₂ control	C ₃₄ : Stabilization
S ₇ : Changeover plate	LD ₂₂ : For F-number indication	R ₆₃ : SR ₆₂ control	C ₃₅ : Noise absorption
S ₈ : changeover switch	LD ₂₃ : FDC lamp	R ₆₄ : Current limiting	C ₃₆ : Stabilization
IC ₁ : Camera. Flash control	LD ₂₄ : Monitor lamp	R ₆₅ : SR ₆₄ control	C ₃₇ : For integrating circuit
IC ₂ : A.P.O counter	PC ₆₁ : For firing limitation	R ₆₆ : Current limiting	C ₃₈ : Stabilization
IC ₃ : Inverter		R ₆₇ : SR ₆₂ control	C ₃₉ : Stabilization
SR ₁ : Oscillation controller	R ₁ : Bias (for Q ₁ /Q ₂)	R ₆₈ : Current limiting	C ₄₀ : For integrating circuit
SR ₆₁ : XE tube flashing	R ₂ : Q ₃ control	R ₆₉ : SR ₆₂ control	C ₄₁ : Stabilization
SR ₆₂ : XE tube control	R ₃ : SR ₁ control	R ₇₀ : Current limiting	C ₄₂ : For integrating circuit
SR ₆₃ : Guide number correction for close up photography	R ₄ : Q ₅ control	R ₇₁ : C ₆₈ charge	C ₄₃ : Stabilization
SR ₆₄ : SR ₆₂ reverse biasing	R ₅ : Q ₅ control	R ₇₂ : For C ₆₈ discharge circuit	C ₄₄ : For multiplying voltage
Q ₁ : Converter circuit oscillation	R ₆ : Q ₅ control	R ₇₃ : SR ₆₄ control	C ₄₅ : Trigger voltage generator
Q ₂ : Control (for Q ₁ /Q ₂)	R ₇ : Q ₅ control	R ₇₄ : C ₆₈ charge	C ₄₆ : For charging voltage suppressor
Q ₃ : Power backup	R ₈ : Q ₇ control	R ₇₅ : C ₆₈ charge	C ₄₇ : For rectification
Q ₄ : Q ₇ control	R ₉ : Voltage division	R ₇₆ : For A.P.O circuit	C ₄₈ : SR ₆₂ control
Q ₅ : IC ₁ power source switch	R ₁₀ : Current limiting	R ₇₇ : Q ₅₂ control	C ₄₉ : Noise adsorption
Q ₂₁ : Signal input switch	R ₁₁ : Q ₇ control	R ₇₈ : Current limiting	C ₅₁ : For Q ₅₁
Q ₂₂ : For sensor	R ₁₂ : Q ₇ control	R ₇₉ : Q ₅₁ control	
Q ₂₃ : output signal circuit	R ₂₁ : Voltage division	R ₈₀ : Divider	
Q ₂₄ : output signal circuit	R ₂₂ : For IC ₂ reset	R ₈₁ : For manual level adjustment	
Q ₂₅ : output signal circuit	R ₂₃ : Voltage division	R ₈₂ : For monitor circuit voltage adjustment	
Q ₂₆ : output signal circuit	R ₂₄ : Voltage division	R ₈₃ : Auto level adjustment	
Q ₂₇ : output signal circuit	R ₂₅ : Voltage division	R ₈₄ : For thermal compensator	
Q ₆₁ : SR ₆₄ control	R ₂₆ : Voltage division		
Q ₆₂ : SR ₆₄ control	R ₂₇ : Voltage division		
Q ₆₃ : SR ₆₄ control	R ₂₈ : Voltage division		
Q ₆₄ : For IC ₂ counting	R ₂₉ : Voltage division		
Q ₆₅ : For signal circuit	R ₃₀ : Voltage division		
Q ₆₆ : For signal circuit	R ₃₁ : Voltage division		
Q ₉₁ : Prevention against misoperation	R ₃₂ : Correction for M/FULL monitor voltage		
PC ₁ : Element for reflection light detecting	R ₃₃ : LD current limiting		
D ₁ : SR ₁ control	R ₃₄ : Voltage division		
D ₂ : External power (low voltage) rectifier	R ₃₅ : For IC ₁ oscillation		
D ₃ : Power smoothing	R ₃₆ : Q ₂₁ control		
D ₄ : External power (high voltage) rectifier	R ₃₇ : Voltage division		
D ₅ : High voltage rectification	R ₃₈ : For signal input circuit		
D ₆ : Counter-flow prevention	R ₃₉ : For integrating circuit		
D ₇ : For low voltage (power source)	R ₄₀ : Q ₂₆ control		
	R ₄₁ : For current control		

Number of element shows the type of P.C board set as follows:

- 1 ~ 19 P.C board-C
- 21 ~ 59 P.C board-A/D
- 61 ~ 79 P.C board-B
- 81 ~ 89 P.C board-E
- 91 ~ 99 P.C board-H

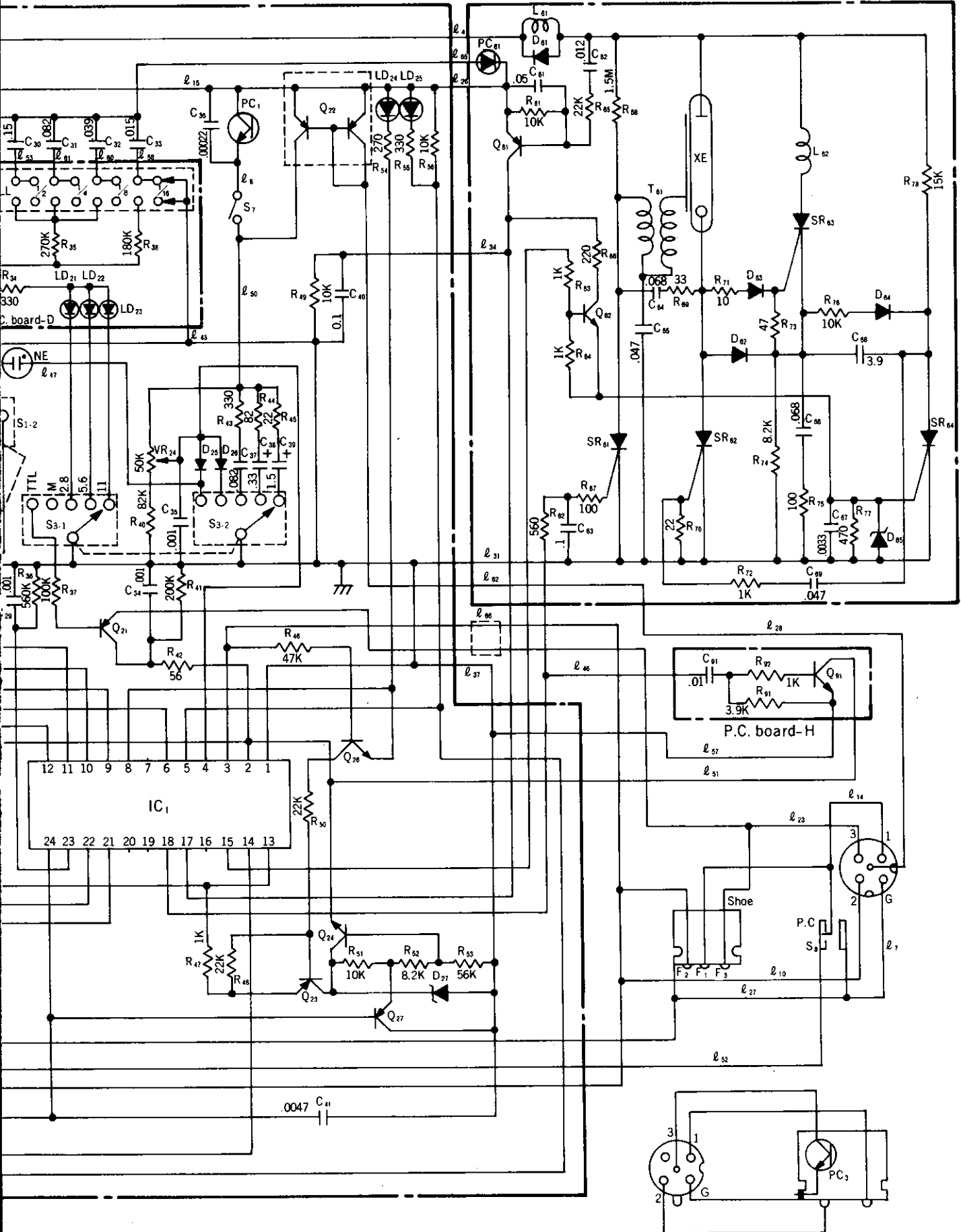
■ Circuit Diagram (8810)

- Unit of condenser capacity is μF .
- コンデンサーの容量は μF の単位です。



P.C. board-A

P.C. board-B



I N D E X

Part No.	Page	Part No.	Page	Part No.	Page
8805-0107-----	1	8805-1009-----	3	8808-1032-----	4
8810-0111-----	5	8668-1012-----	4	8807-1033-----	4
8810-0117-----	3	8805-1012-----	2	8807-1034-----	4
8810-0121-----	6	8808-1012-----	2	8810-1036-----	3
8810-0131-----	7	8805-1013-----	1	8805-1038-----	4
8810-0141-----	8	8808-1013-----	2	8805-1039-----	4
8810-0142-----	5	8805-1014-----	5	8810-1039-----	1
8810-0148-----	2	8808-1014-----	2		
8810-0151-----	8	8805-1015-----	2	8805-1040-----	4
8810-0152-----	4	8805-1016-----	3	8810-1040-----	3
8810-0159-----	4	8805-1017-----	2,3	8805-1044-----	4
8805-0160-----	4	8805-1018-----	1	8805-1046-----	4
8810-0161-----	2	8805-1019-----	1	8810-1047-----	1
8810-0165-----	4	8810-1019-----	3	8805-1048-----	4
8810-0172-----	4			8805-1049-----	4
8805-0500-----	1	8810-1020-----	3	8810-1049-----	6
		8810-1021-----	4		
8810-1001-----	2	8810-1022-----	4	8810-1050-----	2,6
8810-1002-----	2	8805-1025-----	3	8810-1051-----	2
8805-1003-----	1	8805-1026-----	3	8805-1053-----	4
8805-1004-----	3	8810-1026-----	4	8810-1056-----	4
8805-1005-----	3	8810-1027-----	1	8810-1057-----	4
8810-1006-----	3	8810-1029-----	4		
8805-1008-----	2			8805-1067-----	3

I N D E X

Part No.	Page	Part No.	Page	Part No.	Page
8810-1068-----4		9762-2050-07-----1,4		L.E.D	
		9765-2040-07-----4		9353-2081-01-----5,8	
8810-1074-----4				9353-2081-02-----5	
8810-1075-----4		Steel ball			
8810-1078-----3		9758-0200-00-----4		I.C	
8810-1079-----7				9360-0080-04-----5	
		Transformer		9367-3083-01-----8	
8810-1080-----8		9324-1081-08-----7		9367-3084-01-----8	
8810-1084-----3		9324-2081-01-----6			
8810-1085-----1				Diode	
8810-1086-----9		Coil		9361-1082-01-----7	
8810-1087-----6		9324-5081-01-----7		9361-1082-02-----7	
		9324-5082-01-----6			
2006-4254-----3		9324-5082-02-----6		9361-2080-09-----7	
				9361-2082-02-----5,6,7	
8665-9001-----1		Switch		9361-2083-01-----7	
8810-9002-----2		9333-2082-04-----5		9361-2084-06-----7,8	
8810-9003-----1		9333-2082-05-----5		9361-2087-01-----5,6,7	
8810-9004-----3					
8810-9005-----1		Lamp		9361-4081-04-----7	
8810-9006-----2		9351-5081-04-----3		9361-4081-05-----5,6	
8810-9007-----4					
		Xe tube		9361-5081-02-----5	
Screw		9351-6082-06-----3			
9612-2050-07-----2					

I N D E X

Part No.	Page	Part No.	Page	Part No.	Page
Transistor		Thermistor		9393-2805-08-----9	
9362-1081-05-----7		9368-2083-02-----5		9393-2805-09----5,6,9	
9362-1082-01--5,6,7,8		9368-2083-03-----7			
				9393-3003-00-----9	
9363-1080-04-----7		Tube			
9363-1082-01--5,6,7,8		9384-2902-01-----3		9393-3005-00-----9	
9363-1085-01-----5		9384-2905-01----3,5,6		9393-3005-01-----9	
		9384-2907-01-----5		9393-3005-02-----9	
9363-4081-01-----7		9384-2921-01-----2		9393-3005-03-----9	
9363-4085-01-----5		9384-2921-11-----3		9393-3005-04-----9	
				9393-3005-05-----9	
S C R		Lead wires		9393-3005-06-----9	
9365-1080-02-----6		9393-2601-00-----9		9393-3005-07-----9	
9365-1081-03-----6		9393-2601-02-----9		9393-3005-08-----9	
9365-1081-04-----6		9393-2601-03-----9		9393-3005-09-----9	
9365-1081-05-----6					
9365-1081-08-----6		9393-2805-00-----6,9		Fixed resistor	
9365-1083-01-----6		9393-2805-01----5,6,9		9413-1017-80-----6	
		9393-2805-02-----9		9413-1027-80-----6,7	
9365-3081-01-----7		9393-2805-03-----9		9413-1557-80-----6	
		9393-2805-04-----9		9413-3307-80-----6	
Photo diode		9393-2805-05-----9		9413-6847-80-----7	
9368-1085-01-----6		9393-2805-06-----5,9			
		9393-2805-07-----9		9422-1006-80-----6	

I N D E X

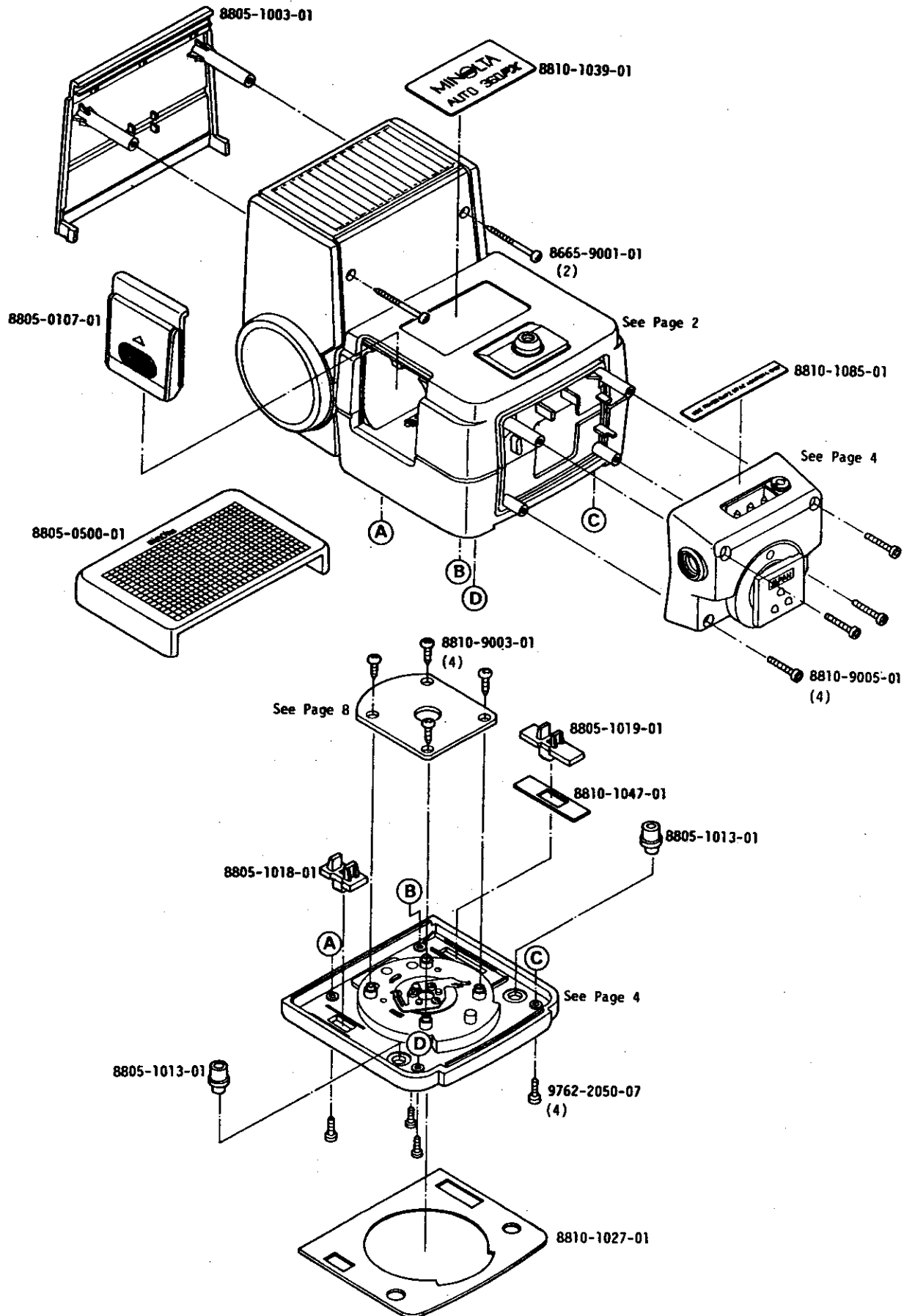
Part No.	Page	Part No.	Page	Part No.	Page
9422-1016-80-----6		9422-3356-80-----5		9423-5644-80-----5	
9422-1026-80-----5,6		9422-3936-80-----5			
9422-1035-80-----5				9435-1036-80-----6	
9422-1036-80----5,6,7		9422-4706-80-----5,6		9435-8226-80-----6	
9422-1046-80-----5,8		9422-4716-80-----6			
		9422-4725-80-----8		9436-1536-80-----6	
9422-1236-80-----5		9422-4736-80-----5,8			
9422-1526-80-----7				Variable resistor	
9422-1536-80-----5,7		9422-5606-80-----5		9462-2039-80-----5	
9422-1545-80-----5		9422-5616-80-----6		9462-2049-80-----5	
9422-1546-80-----5		9422-5635-80-----5		9462-5039-80-----5	
9422-1556-80-----5					
9422-1825-80-----8		9422-6836-80-----5		Condenser	
9422-1845-80-----8				9512-1075-80-----7	
		9422-8206-80-----5		9512-2275-80-----7	
9422-2046-80-----5		9422-8225-80-----5		9512-4765-85-----7	
9422-2206-80-----5,6		9422-8226-80-----7			
9422-2216-80-----6		9422-8236-80-----5		9532-1065-80-----5	
9422-2236-80----5,6,8				9532-3355-80-----5	
9422-2716-80-----5		9422-9126-80-----8			
9422-2745-80-----8				9534-1554-80-----5	
9422-3316-80-----5,8		9423-2446-80-----7			
9422-3336-80-----8		9423-2756-80-----7		9535-1055-80-----5	

I N D E X

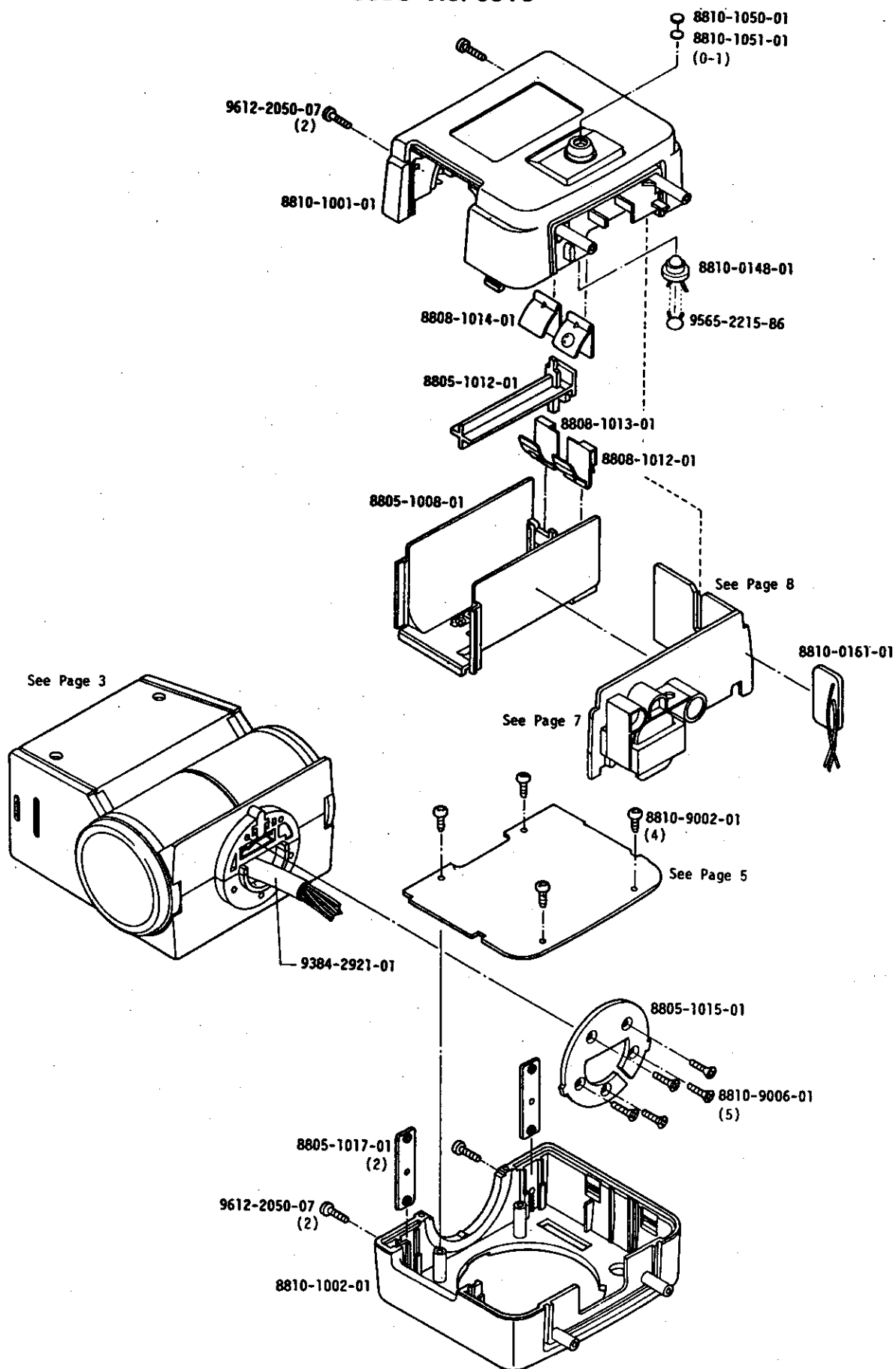
Part No.	Page	Part No.	Page
9535-3344-80-----	5	9595-1023-81-----	5
		9595-1533-81-----	5
9545-6833-80-----	5	9595-6825-81-----	7
9548-1544-82-----	5	9599-1235-81-----	6
9548-3934-82-----	5		
9548-4735-82-----	6		
9548-6835-82-----	6		
9548-8234-82-----	5		
9549-3954-82-----	6		
9563-1045-86-----	5,6		
9563-5035-86-----	6		
9564-1035-86-----	5,7		
9564-3325-86-----	6		
9564-4725-86-----	5		
9564-6825-86-----	7		
9565-1015-86-----	5		
9565-1025-86-----	5,8		
9565-2215-86-----	2		

AUTO ELECTRO FLASH 360PX

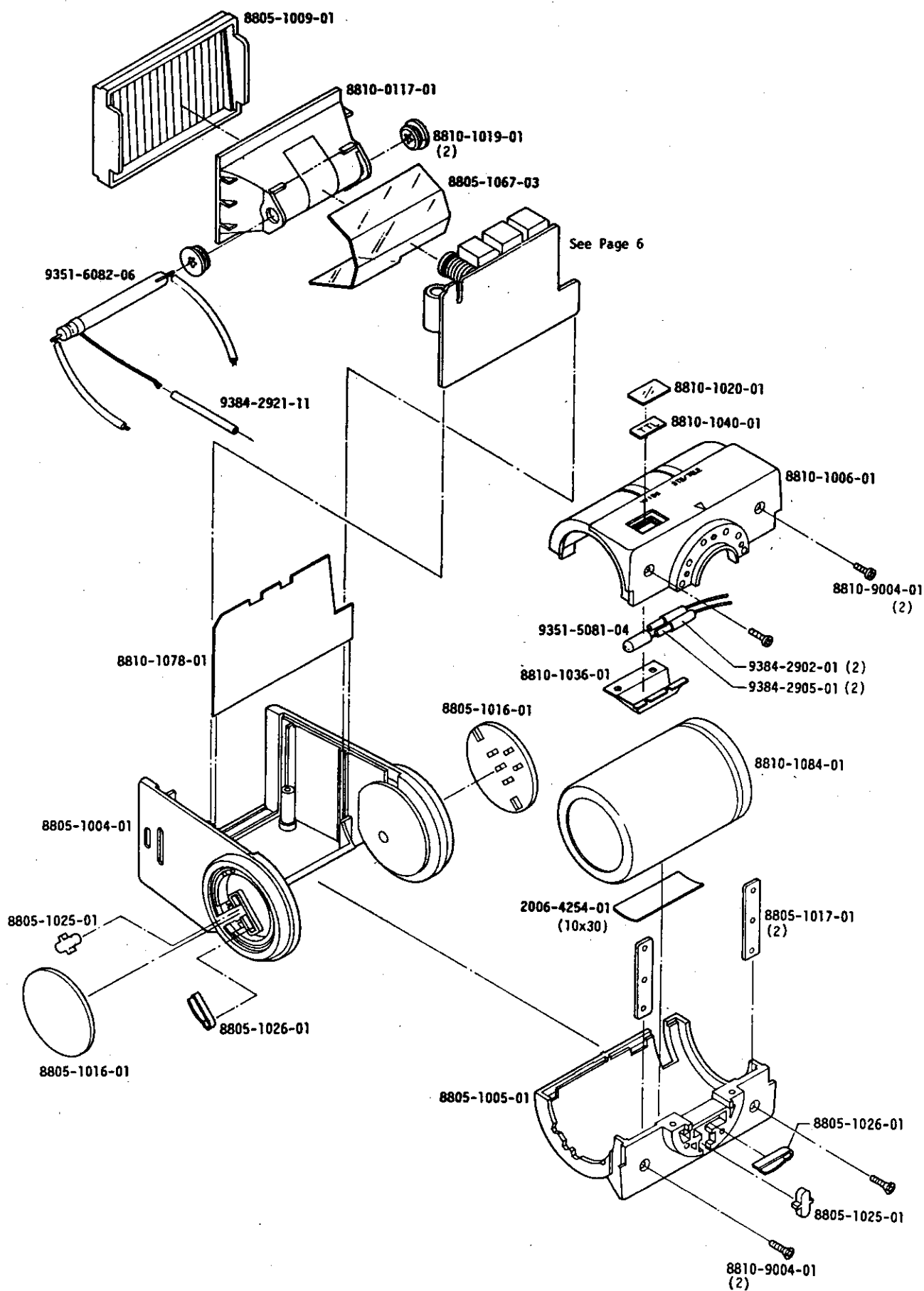
CODE No. 8810



Part No.	Part Name		Qty
8805-0107-01	Battery cover set	電池蓋セット	1
8805-0500-01	Wide panel (W1-A 28mm)	ワイドパネル	1
8805-1003-01	H case A	頭部ケースA	1
8805-1013-01	Open flash button	単発釦	2
8805-1018-01	Switch cover A	電源スイッチ	1
8805-1019-01	Switch cover B	モードセレクター	1
8810-1027-01	Indication plate	表示板	1
8810-1039-01	Name plate	前銘板	1
8810-1047-01	Spacer	スイッチスペーサー	1
8810-1085-01	Instruction label	シール	1
8665-9001-01	Tapping screw	止めねじ	2
8810-9003-01	Screw	止めねじ	4
8810-9005-01	Screw	止めねじ	4
9762-2050-07	Tap tite screw	十字穴付なべ頭タップタイトねじ	4

AUTO ELECTRO FLASH 360PX**CODE No. 8810**

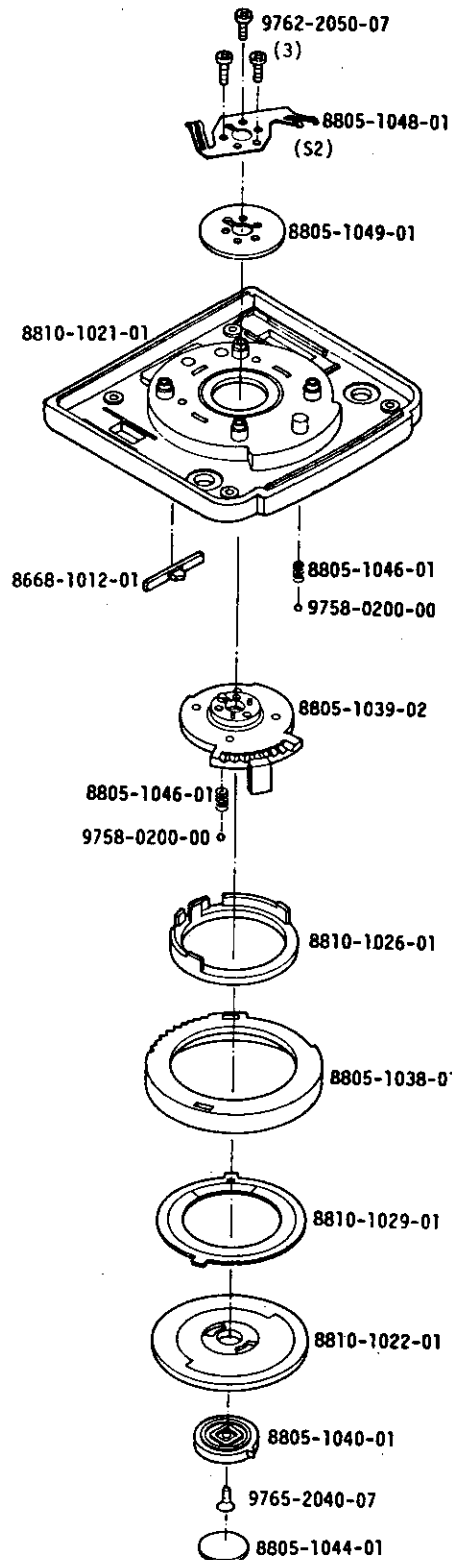
Part No.	Part Name		Qty
8810-0161-01	Board-H set	プリント基板Hセット	1
8810-0148-01	Photo transistor set (PC1)	フォトトランジスターセット	1
8810-1001-01	Case A	本体ケースA	1
8810-1002-01	Case B	本体ケースB	1
8805-1008-01	Battery chamber	電池ケース	1
8805-1012-01	Battery separator	電池セパレーター	1
8808-1012-01	Battery (+) contact	電池接片 (+)	1
8808-1013-01	Battery (-) contact	電池接片 (-)	1
8808-1014-01	Battery contact	電池共通接片	1
8805-1015-01	Rotary axis set plate	回転軸止め金具	1
8805-1017-01	Shoe set plate	シュー止め板	2
8810-1050-01	Protection plate	センサー保護板	1
8810-1051-01	ND filter (0.6)	NDフィルター (0.6)	0-1
8810-9002-01	Screw	止めねじ	4
8810-9006-01	Screw	止めねじ	5
9384-2921-01	Tube (per roll) Tu14 $\phi 5$ $\ell=30$, Tu15 $\phi 5$ $\ell=40$		2
9565-2215-86	Ceramic condenser(C36: 220PF/50V)		1
9612-2050-07	Phillips type screw	十字穴付なべ頭小ねじ	4

AUTO ELECTRO FLASH 360PX**CODE No. 8810**

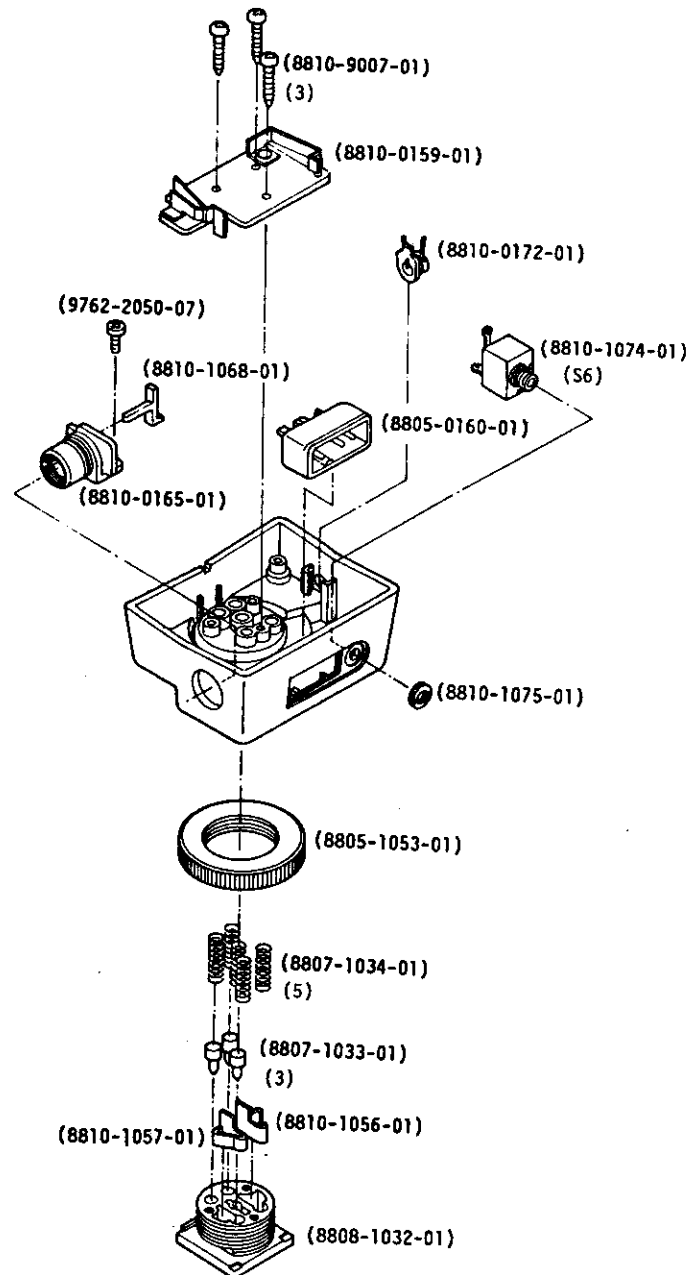
Part No.	Part Name		Qty
8810-0117-01	Reflector set	反射傘セット	1
8805-1004-01	H case B	頭部ケースB	1
8805-1005-01	H case C	頭部ケースC	1
8810-1006-01	H case D	頭部ケースD	1
8805-1009-01	Panel	アクリルパネル	1
8805-1016-01	H B side plate	頭部側板B	2
8805-1017-01	Shoe set plate	シュー止め板	2
8810-1019-01	Xe. bush	Xe ブッシング	2
8810-1020-01	TTL window	表示窓	1
8805-1025-01	Shoe click	シュークリック突子	2
8805-1026-01	Click spring	クリックばね	2
8810-1036-01	Lamp reflector	ランプ反射板	1
8810-1040-01	TTL plate	表示銘板	1
8805-1067-03	Isolation paper-C	絶縁紙C	1
8810-1078-01	Isolation paper-D	絶縁紙D	1
8810-1084-01	Main condenser (C7: 1100 μ F/350V)	メインコンデンサー	1
2006-4254-01	Tape A (Per roll) 10X30	両面テープ	1
8810-9004-01	Screw	止めねじ	4
9351-5081-04	TTL Lamp(NE)	TTL ランプ	1
9351-6082-06	Xe. tube (XE)	Xe チューブ	1
9384-2902-01	Tube (Per roll) Tu1	$\phi 2 \quad l = 15$	2
9384-2905-01	Tube (Per roll) Tu4	$\phi 1 \quad l = 12$	2
9384-2921-11	Tube (Per roll) Tu16	$\phi 1 \quad l = 50$	1

AUTO ELECTRO FLASH 360PX

CODE No. 8810



Assy. Part No. 8810-0152-01



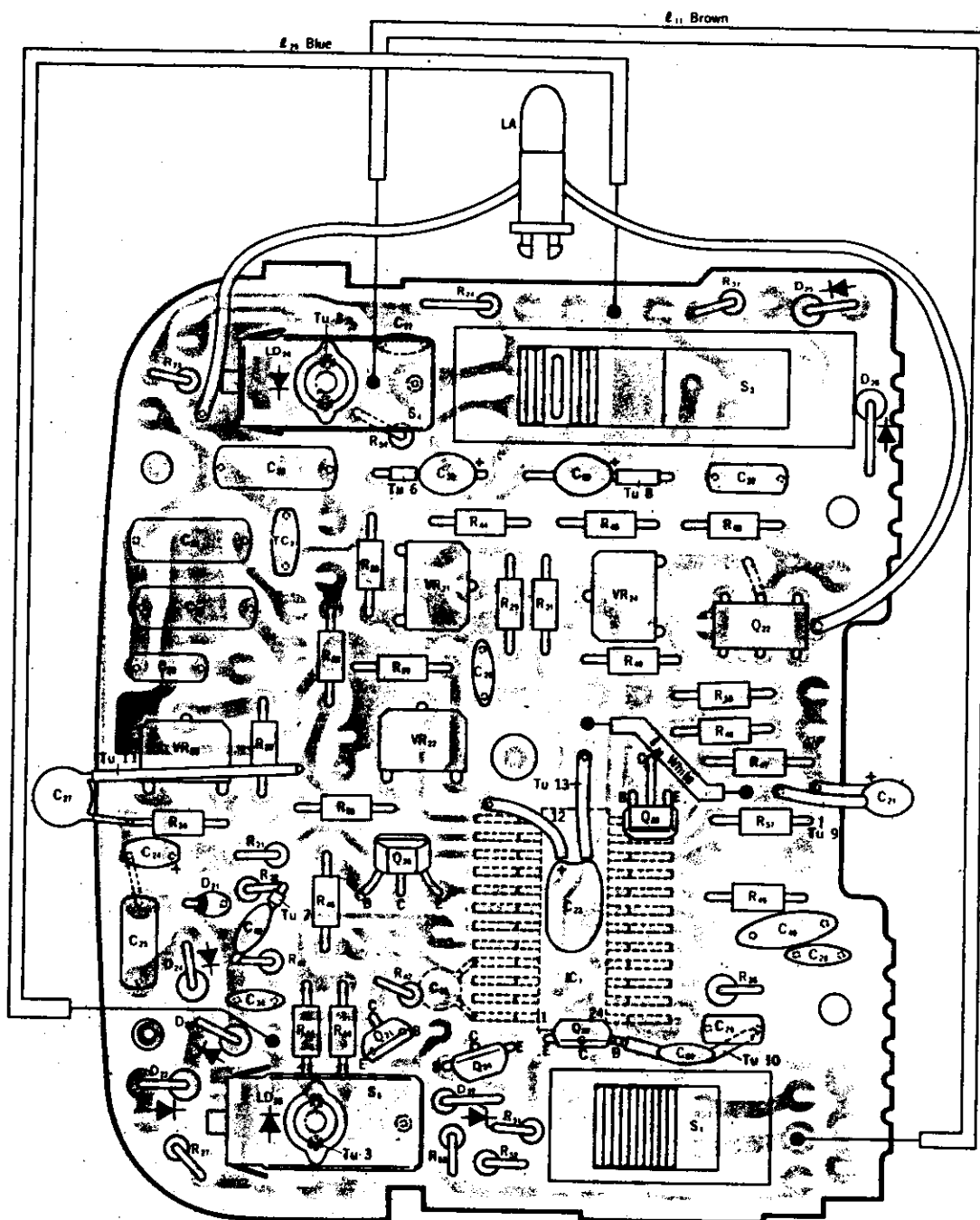
Part No.	Part Name		Qty
8810-0152-01	Shoe set	シューセット	1
(8810-0159-01)	Board-F set	プリント基板Fセット	1
(8805-0160-01)	Consent cover set	コンセントカバーセット	1
(8810-0165-01)	Accessory terminal set	アクセサリ用ターミナルセット	1
(8810-0172-01)	Sync cord terminal set	シンクロコードソケットセット	1
(8808-1032-01)	Shoe case	シューケース B	1
(8807-1033-01)	Sync contact	シュー接点	3
(8807-1034-01)	Shoe contact spring	シュー接点ばね	5
(8805-1053-01)	Shoe nut	シューナット	1
(8810-1056-01)	Shoe contact	シュー接片 (一)	1
(8810-1057-01)	Shoe contact-B	シュー接片B (一)	1
(8810-1068-01)	Changeover plate	センサー切替突子	1
(8810-1074-01)	Cable-FB terminal	充電制御用ソケット	1
(8810-1075-01)	Nut	ジャックナット	1
(8810-9007-01)	Screw	止めねじ	3
(9762-2050-07)	Tap tite screw	十字穴付なべ頭タップタイトねじ	1
8668-1012-01	Click spring	クリックばね	1
8810-1021-01	Exposure dial base plate	露出表示台板	1
8810-1022-01	Distance scale plate	距離目盛板	1
8810-1026-01	Middle ring	中間リング	1
8810-1029-01	Aperture scale plate	絞り目盛環	1
8805-1038-01	Exposure dial C	フィルム感度設定ダイヤル	1
8805-1039-02	Exposure dial D	GN リング	1
8805-1040-01	Exposure dial E	パネル指標板	1
8805-1044-01	Exposure dial E name plate	パネル指標飾り板	1
8805-1046-01	Click spring	クリックスプリング	2
8805-1048-01	Brush	ブラシ	1
8805-1049-01	Washer	ワッシャー	1
9758-0200-00	Steel ball	スチールボール	2
9762-2050-07	Tap tite screw	十字穴付なべ頭タップタイトねじ	3
9765-2040-07	Tap tite screw	十字穴付皿頭タップタイトねじ	1

AUTO ELECTRO FLASH 360PX

CODE No. 8810

Assy. Part No. 8810-0111-01

Assy. Part Name. P.C. board-A set



Assy. Part No. 8810-0111-01

Assy. Part Name P.C. board-A set
プリント基板 Aセット

Symbol	Part No.	Com	Part Name	Type	Qty.
IC1	9360-0080-04		I C	M54415P	1
LD24	9353-2081-02		L.E.D	LN38GP	1
LD25	9353-2081-01			LN-28RP	1
D21	9361-5081-02		Varistor	KB-269	1
D26,D25,D24 D23,D22	9361-2082-02		Diode	10D-8	5
	9361-2087-01			IN4006	
D27	9361-4081-05		Zenner diode	MZ-303	1
Q21	9363-4085-01		Transistor	2SB808	1
Q22	9363-1085-01			2SA1237	1
Q27,Q23	9363-1082-01			2SA1115	2
Q26,Q24	9362-1082-01			2SC2603	2
R30,R21	9422-1236-80		Fixed resistor	1/8W 12k Ω	2
R25,R22	9422-1536-80			1/8W 15k Ω	2
R37,R23	9422-1046-80			1/8W 100k Ω	2
R24	9422-3356-80			1/8W 3.3M Ω	1
R26	9422-3936-80			1/8W 39k Ω	1
R27	9422-4706-80			1/8W 47 Ω	1
R28	9422-6836-80			1/8W 68k Ω	1
R29	9422-1546-80			1/8W 150k Ω	1
R51,R31	9422-1035-80			1/8W 10k Ω	2
R32	9422-1545-80			1/8W 150k Ω	1
R33	9422-1556-80			1/8W 1.5M Ω	1
R36	9423-5644-80			1/4W 560k Ω	1
R40	9422-8236-80			1/8W 82k Ω	1
R41	9422-2046-80			1/8W 200k Ω	1
R42	9422-5606-80			1/8W 56 Ω	1
R55,R43	9422-3316-80			1/8W 330 Ω	2
R44	9422-8206-80			1/8W 82 Ω	1
R45	9422-2206-80			1/8W 22 Ω	1
R46	9422-4736-80			1/8W 47k Ω	1
R47	9422-1026-80			1/8W 1k Ω	1
R50,R48	9422-2236-80			1/8W 22k Ω	2
R57,R56,P49	9422-1036-80			1/8W 10k Ω	3
R52	9422-8225-80			1/8W 8.2k Ω	1
R53	9422-5635-80			1/8W 56k Ω	1
R54	9422-2716-80			1/8W 270 Ω	1
VR21	9462-2049-80		Variable resistor	0.1W 200k Ω	1
VR23,VR22	9462-2039-80			0.1W 20k Ω	2
VR24	9462-5039-80			0.1W 50k Ω	1
TC21	9368-2083-02		Thermistor	TD5-C310D2	1
LA	8810-0142-01		Lamp	ML-5X60	1
S1	9333-2082-04		Switch	SKM-22-03BP	1
S3	9333-2082-05			SKM-26-045BP	1
S5,S4	8805-1014-01		Open flash contact		2

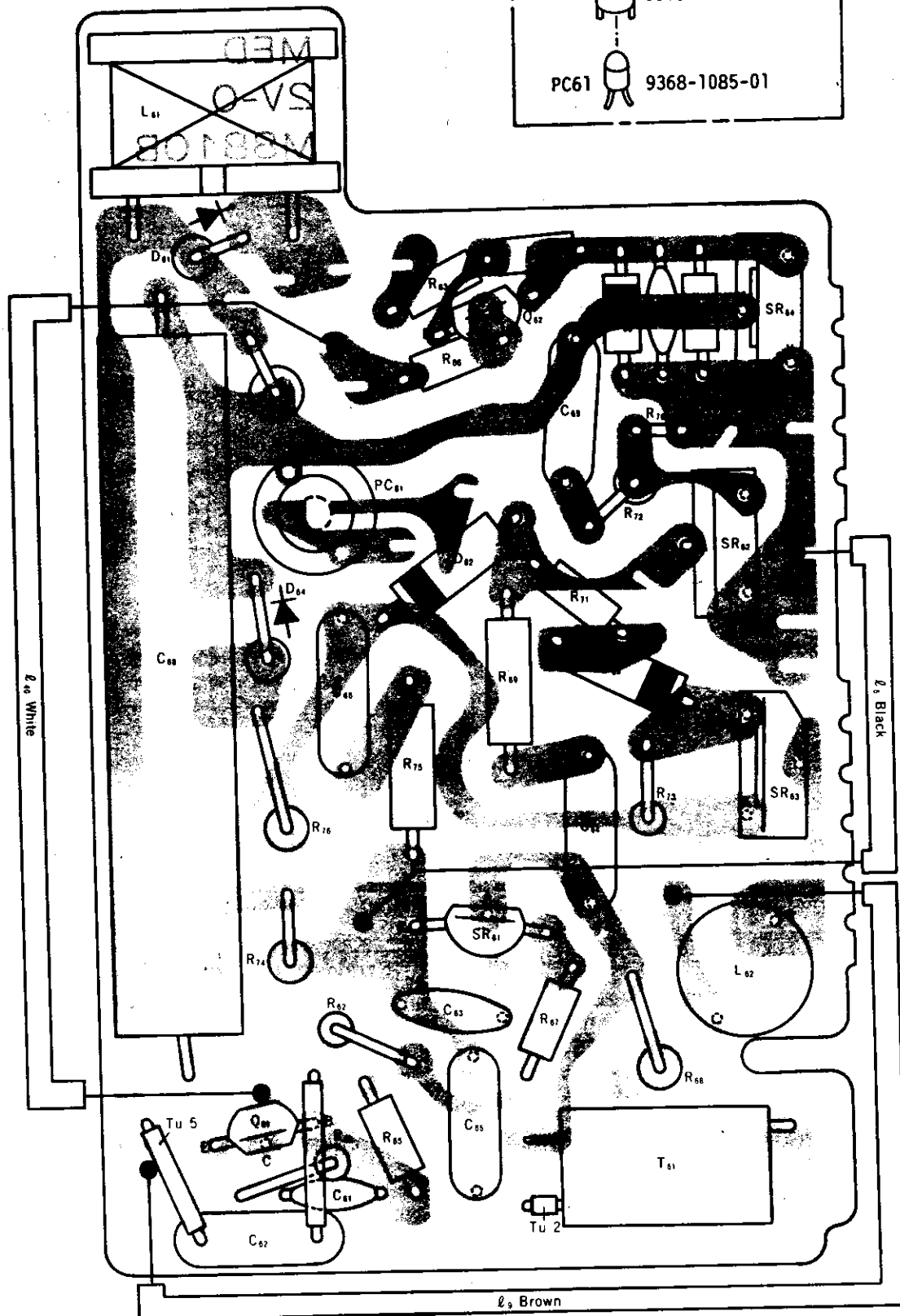
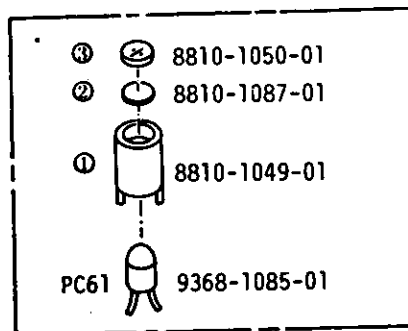
Symbol	Part No.	Com	Part Name		Type	Qty.
C21	9532-1065-80		Tantalum	Condenser	10 μ F/10V	1
C42,C27,C22	9564-1035-86		Ceramic		0.01 μ F/25V	3
C23	9535-1055-80		Tantalum		1 μ F/35V	1
C24	9532-3355-80				3.3 μ F/10V	1
C25	9545-6833-80		Plastic		0.068 μ F/50V	1
C26	9565-1015-86		Ceramic		100PF/50V	1
C41,C28	9564-4725-86				4700PF/25V	2
C29	9595-1023-81		Mylar		1000PF/50V	1
C30	9548-1544-82		Plastic		0.15 μ F/350V	1
C37,C31	9548-8234-82				0.082 μ F/350V	2
C32	9548-3934-82				0.039 μ F/350V	1
C33	9595-1533-81		Mylar		0.015 μ F/50V	1
C35,C34	9565-1025-86		Ceramic		1000PF/50V	2
C38	9535-3344-80		Tantalum		0.33 μ F/35V	1
C39	9534-1554-80				1.5 μ F/25V	1
C40	9563-1045-86		Ceramic		0.1 μ F/12V	1
ℓ 11	9393-2805-01		Lead wire	Brown	UL1571 AWG28 ℓ =90	1
ℓ 29	9393-2805-06			Blue	UL1571 AWG28 ℓ =90	1
ℓ 39	9393-2805-09			White	UL1571 AWG28 ℓ =35	1
Tu3	9384-2905-01		Tube		∅0.65 ℓ=7	1
Tu7,Tu6	9384-2907-01				∅0.65 ℓ=3	2
Tu10,Tu9,Tu8	9384-2907-01				∅0.65 ℓ=5	5
Tu11	9384-2907-01				∅0.65 ℓ=10	1
Tu13	9384-2907-01				∅0.65 ℓ=14	2

AUTO ELECTRO FLASH 360PX

CODE No. 8810

Assy. Part No. 8810-0121-01

Assy. Part Name. P.C. board-B set



Assy. Part No. 8810-0121-01

Assy. Part Name

P.C. board-B set

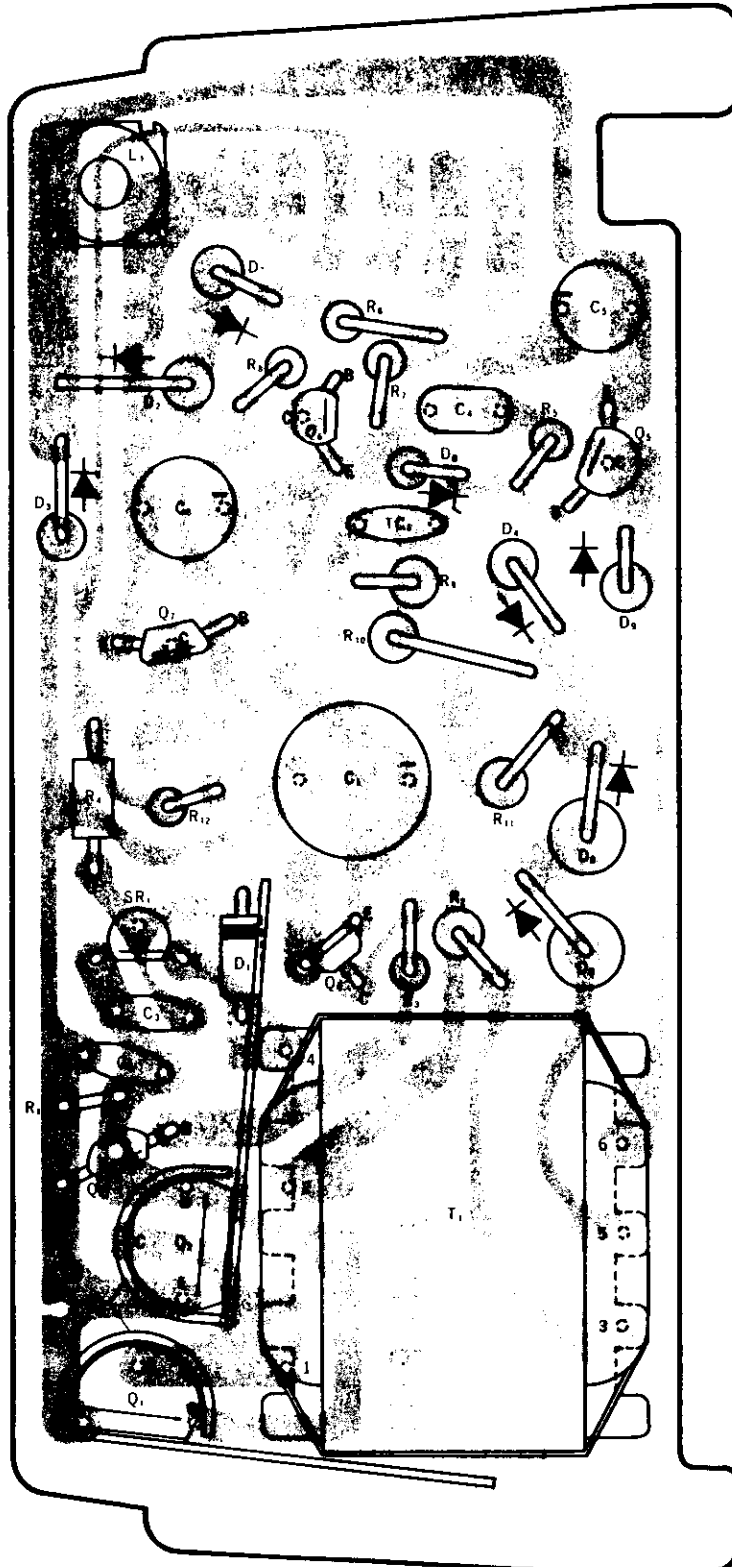
プリント基板B セット

Symbol	Part No.	Com	Part Name		Type	Qty.
D64,D63,D62,D61	9361-2082-02		Diode		10D-8	4
	9361-2087-01				1N4006	
D65	9361-4081-05		Zenner diode		MZ303	1
Q61	9363-1082-01		Transistor		2SA1115	1
Q62	9362-1082-01				2SC2603	1
SR61	9365-1083-01		S C R		03P4M	1
	9365-1081-04				CR02AM-8	
	9365-1080-02				M21CA(Q)	
SR62	9365-1081-03				CR3JM-8	1
SR63	9365-1081-08				CR3EM-8	1
SR64	9365-1081-05				CR3CM-8	1
R61	9422-1036-80		Fixed resistor		1/8W 10 k Ω	1
R62	9422-5616-80				1/8W 560 Ω	1
R64,R63	9422-1026-80				1/8W 1k Ω	2
	9422-2236-80				1/8W 22k Ω	1
R66	9422-2216-80				1/8W 220 Ω	1
R67	9422-1016-80				1/8W 100 Ω	1
R68	9413-1557-80				1/4W 1.5M Ω	1
R69	9413-3307-80				1/4W 33 Ω	1
R70	9422-2206-80				1/8W 22 Ω	1
R71	9422-1006-80				1/8W 10 Ω	1
R72	9413-1027-80				1/4W 1k Ω	1
R73	9422-4706-80				1/8W 47 Ω	1
R74	9435-8226-80				1W 8.2k Ω	1
R75	9413-1017-80				1/4W 100 Ω	1
R76	9435-1036-80				1W 10k Ω	1
R77	9422-4716-80				1/8W 470 Ω	1
R78	9436-1536-80				2W 15k Ω	1
C61	9563-5035-86		Ceramic	Condenser	0.05 μ F/12V	1
C62	9599-1235-81		Mylar		0.012 μ F/400V	1
C63	9563-1045-86		Ceramic		0.1 μ F/12V	1
C66,C64	9548-6835-82		Plastic		0.068 μ F/350V	2
C69,C65	9548-4735-82				0.047F/350V	2
C67	9564-3325-86		Ceramic		3300pF/25V	1
C68	9549-3954-82		Plastic		3.9 μ F/450V	1
T61	9324-2081-01		Transformer		NC-850	1
L61	9324-5082-01		Coil		272L1	1
L62	9324-5082-02				L2(0535)	1
PC61	9368-1085-01		Photo diode		SPI-CL3	1
16	9393-2805-00		Lead wire	Black	UL1571 AWG28 ℓ =50	1
19	9393-2805-01			Brown	UL1571 AWG28 ℓ =50	1
140	9393-2805-09			White	UL1571 AWG28 ℓ =60	1
Tu2	9384-2905-01		Tube		ϕ 1 ℓ =3	1
Tu5	9384-2905-01				ϕ 1 ℓ =17	2
①	8810-1049-01		Photo diode holder			1
②	8810-1087-01		ND Filter(0.3)			1
③	8810-1050-01		Protection plate			1

AUTO ELECTRO FLASH 360PX**CODE No. 8810**

Assy. Part No. 8810-0131-01

Assy. Part Name. P.C. board-C set



Assy. Part No. 8810-0131-01 Assy. Part Name P.C. board-C set
プリント基板C セット

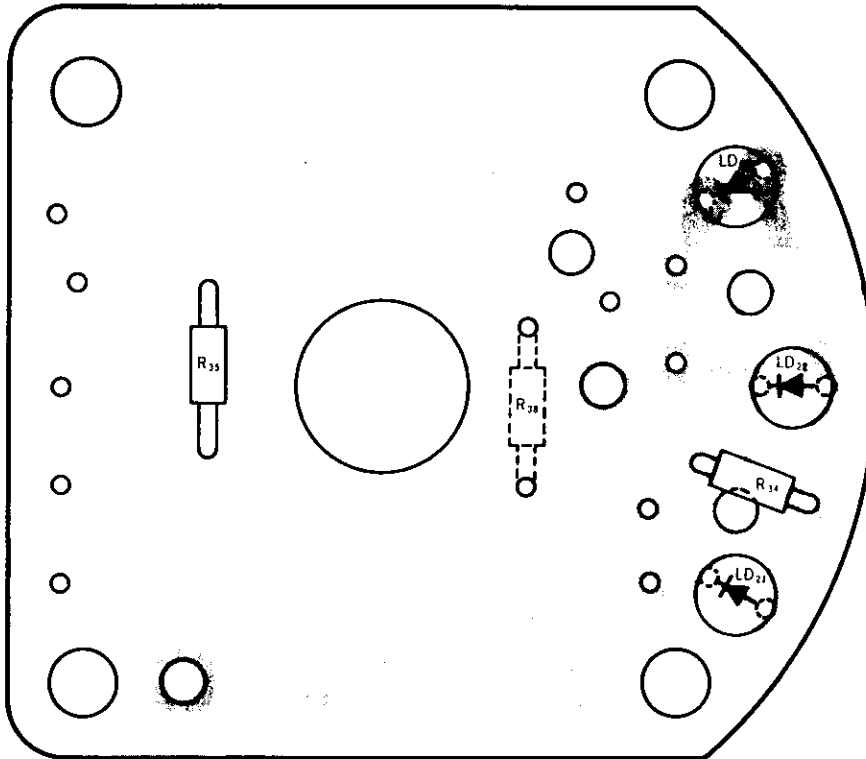
Symbol	Part No.	Com	Part Name	Type	Qty.
D1	9361-2084-06		Diode	MA-165	1
D7,D4,D2	9361-2082-02			10D-8	} 3
	9361-2087-01			1M4006	
D3	9361-1082-01			11DQ-03	} 1
	9361-1082-02			11DQ-02	
D6,D5	9361-2083-01			SIR-150	2
D8	9361-4081-04		Zenner diode	MZ-304	1
D9	9361-2080-09		Diode	TVRID	1
Q2,Q1	9363-1080-04		Transistor	2SB873A	2
Q3	9363-1082-01			2SA1115	1
Q6 Q4	9362-1082-01			2SC2603	2
Q5	9362-1081-05			2SC3112	1
Q7	9363-4081-01			2SA1150(Y)	1
SR1	9365-3081-01		S C R	NT-101	1
R1	9422-8226-80		Fixed resistor	1/8W 8.2K Ω	1
R2	9413-1027-80			1/4W 1K Ω	1
R3	9422-1526-80			1/8W 1.5K Ω	1
R12,R8,R7,R6 R4	9422-1036-80			1/8W 10K Ω	5
R5	9422-1536-80			1/8W 15K Ω	1
R9	9423-2446-80			1/4W 240K Ω	1
R10	9423-2756-80			1/4W 2.7M Ω	1
R11	9413-6847-80			1/4W 680K Ω	1
C1	9512-2275-80		Electrolytic	220 μ F/10V	1
C2	9564-1035-86		Ceramic	0.01 μ F/25V	1
C3	9564-6825-86			6800PF/25V	1
C4	9595-6825-81			6800PF/50V	1
C5	9512-1075-80		Electrolytic	100 μ F/10V	1
C6	9512-4765-85			47 μ F/10V	1
TC1	9368-2083-03		Thermistor	TD5-C420DA2	1
T1	9324-1081-08		Transformer	1988	1
L1	9324-5081-01		Coil	CH-14	1
①	8810-1079-01		Radiator 放熱板		2

AUTO ELECTRO FLASH 360PX

CODE No. 8810

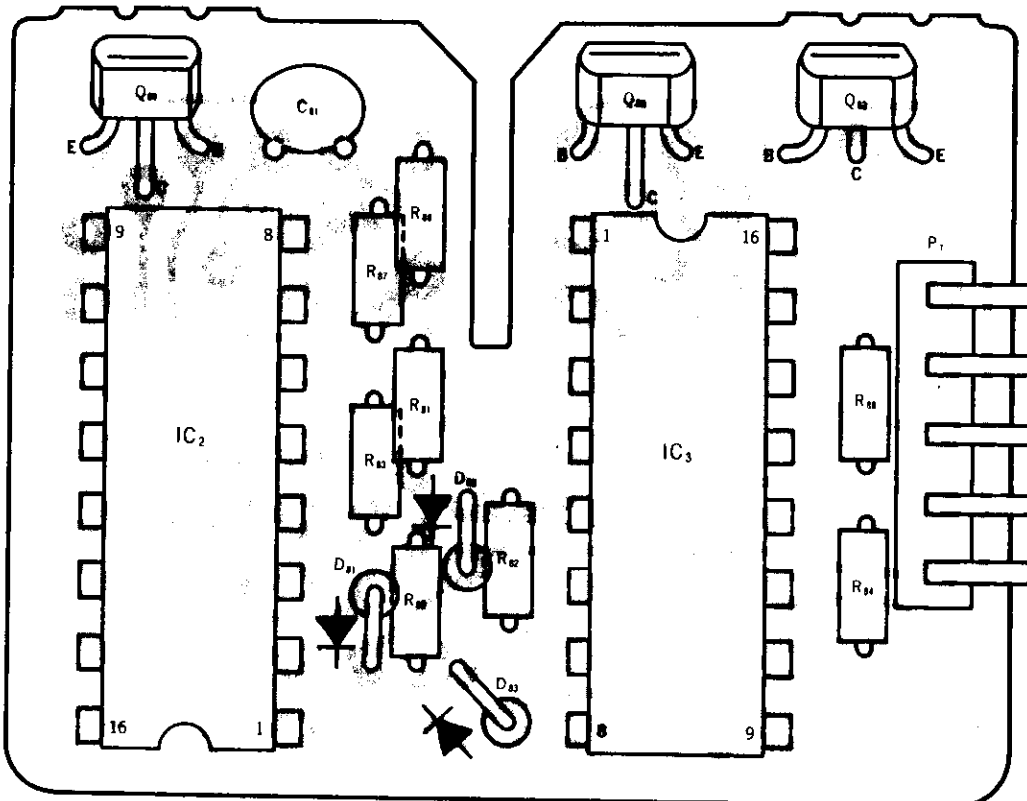
Assy. Part No. 8810-0141-01

Assy. Part Name. P.C. board-D set



Assy. Part No. 8810-0151-01

Assy. Part Name. P.C. board-E set



Assy. Part No. 8810-0141-01

Assy. Part Name

P.C. board-Dset
プリント基板D セット

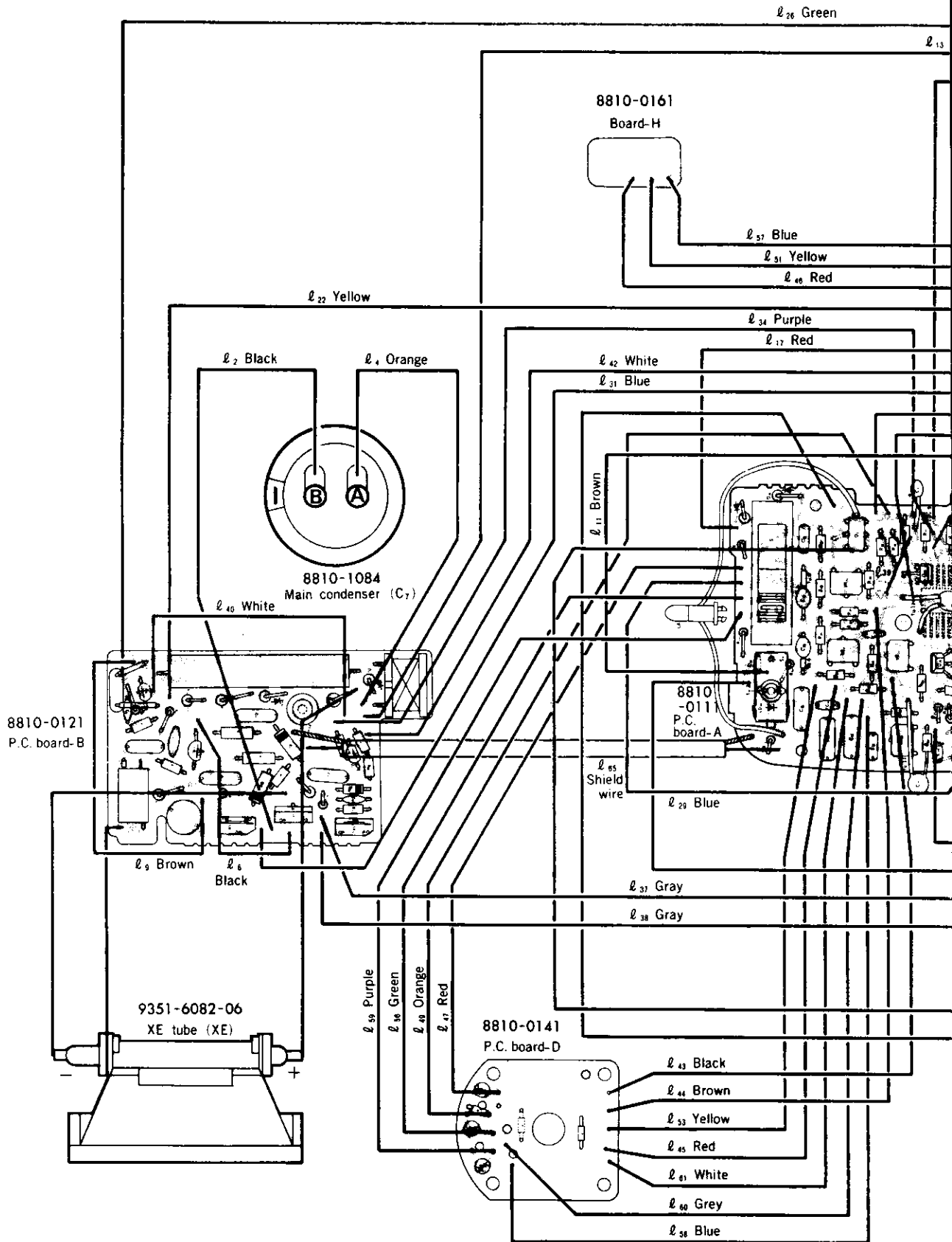
Symbol	Part No.	Com	Part Name	Type	Qty.
LD23,LD22,LD21	9353-2081-01		L.E.D	LN-28RP	3
R34	9422-3316-80		Fixed resistor	1/8W 330 Ω	1
R35	9422-2745-80			1/8W 270k Ω	1
R38	9422-1845-80			1/8W 180k Ω	1

Assy. Part No. 8810-0151-01

Assy. Part Name

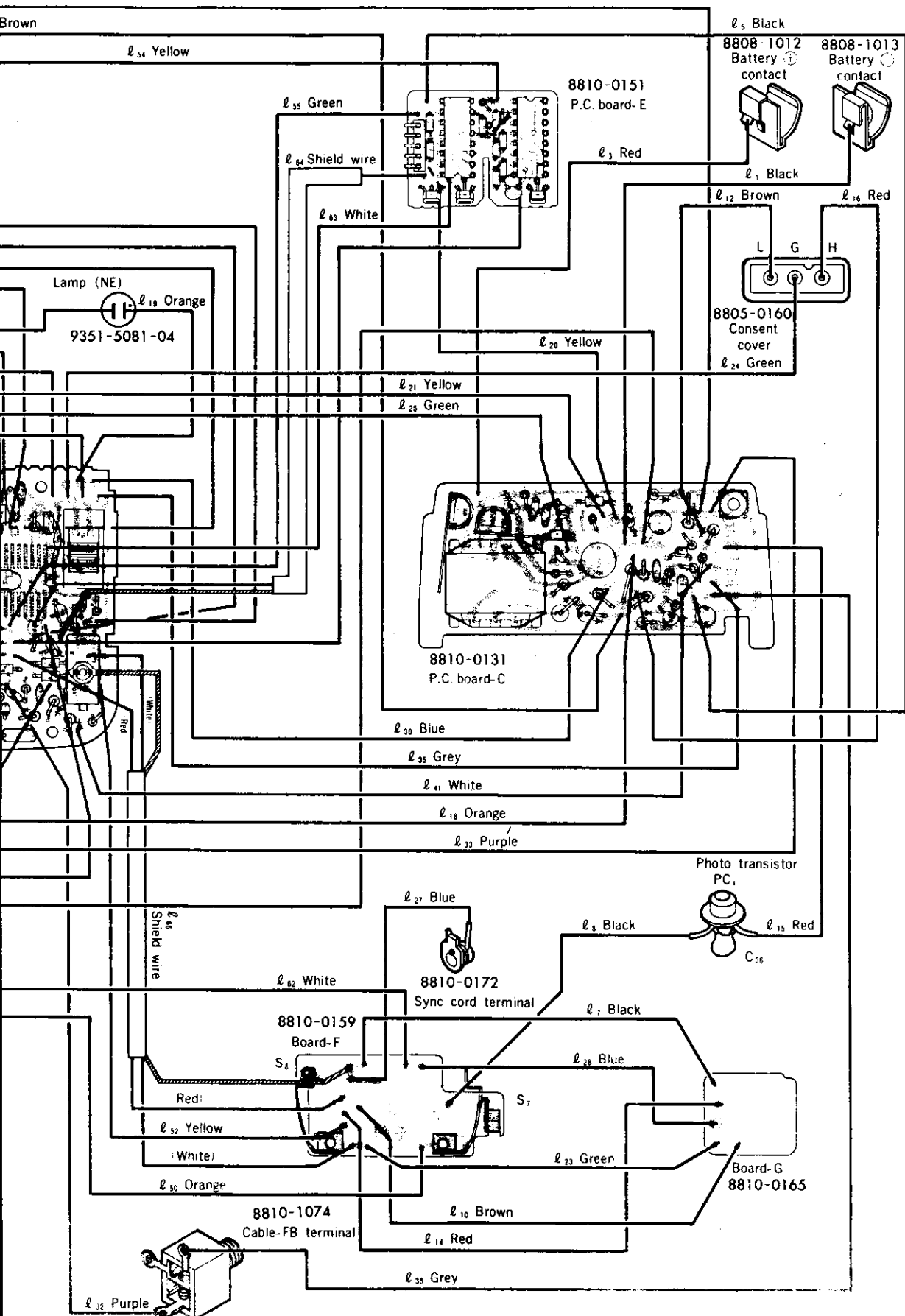
P.C. board-E set
プリント基板 Eセット

Symbol	Part No.	Com	Part Name	Type	Qty.
IC2	9367-3084-01		I C	HD-14040B	1
IC3	9367-3083-01			TC4049BP	1
Q83,Q81	9362-1082-01		Transistor	2SC2603	2
Q82	9363-1082-01			2SA1115	1
D83,D82,D81	9361-2084-06		Diode	MA-165	3
R82,R81	9422-4736-80		Fixed resistor	1/8W 47k Ω	2
R83	9422-1046-80			1/8W 100k Ω	1
R84	9422-4725-80			1/8W 47k Ω	1
R85	9422-3336-80			1/8W 33k Ω	1
R86	9422-2236-80			1/8W 22k Ω	1
R87	9422-9126-80			1/8W 9.1k Ω	1
R88	9422-1825-80			1/8W 1.8k Ω	1
C81	9565-1025-86		Ceramic condenser	1000PF/50V	1
P1	8810-1080-01		Connector	MB-5P905P	1



ELECTRO FLASH 360PX

CODE No. 8810



Lead wires list

Symbol	Part No.	Color	Typ.	Qty.
ℓ1	9393-2601-00	Black	UL1007 AWG26 ℓ=120	1
ℓ2	9393-2601-00	Black	UL1007 AWG26 ℓ=150	1
ℓ3	9393-2601-02	Red	UL1007 AWG26 ℓ=130	1
ℓ4	9393-2601-03	Orange	UL1007 AWG26 ℓ=140	1
ℓ5	9393-2805-00	Black	UL1571 AWG28 ℓ=40	1
ℓ6	9393-2805-00	Black	UL1571 AWG28 ℓ=50	1
ℓ7	9393-2805-00	Black	UL1571 AWG28 ℓ=70	1
ℓ8	9393-2805-00	Black	UL1571 AWG28 ℓ=140	1
ℓ9	9393-2805-01	Brown	UL1571 AWG28 ℓ=50	1
ℓ10	9393-2805-01	Brown	UL1571 AWG28 ℓ=70	1
ℓ11	9393-2805-01	Brown	UL1571 AWG28 ℓ=90	1
ℓ12	9393-2805-01	Brown	UL1571 AWG28 ℓ=100	1
ℓ13	9393-2805-01	Brown	UL1571 AWG28 ℓ=285	1
ℓ14	9393-2805-02	Red	UL1571 AWG28 ℓ=70	1
ℓ16, ℓ15	9393-2805-02	Red	UL1571 AWG28 ℓ=100	2
ℓ17	9393-2805-02	Red	UL1571 AWG28 ℓ=170	1
ℓ18	9393-2805-03	Orange	UL1571 AWG28 ℓ=90	1
ℓ19	9393-2805-03	Orange	UL1571 AWG28 ℓ=130	1
ℓ20	9393-2805-04	Yellow	UL1571 AWG28 ℓ=90	1
ℓ21	9393-2805-04	Yellow	UL1571 AWG28 ℓ=140	1
ℓ22	9393-2805-04	Yellow	UL1571 AWG28 ℓ=200	1
ℓ23	9393-2805-05	Green	UL1571 AWG28 ℓ=70	1
ℓ24	9393-2805-05	Green	UL1571 AWG28 ℓ=120	1
ℓ25	9393-2805-05	Green	UL1571 AWG28 ℓ=130	1
ℓ26	9393-2805-05	Green	UL1571 AWG28 ℓ=320	1
ℓ27	9393-2805-06	Blue	UL1571 AWG28 ℓ=40	1
ℓ28	9393-2805-06	Blue	UL1571 AWG28 ℓ=70	1
ℓ29	9393-2805-06	Blue	UL1571 AWG28 ℓ=90	1
ℓ30	9393-2805-06	Blue	UL1571 AWG28 ℓ=145	1
ℓ31	9393-2805-06	Blue	UL1571 AWG28 ℓ=190	1
ℓ32	9393-2805-07	Purple	UL1571 AWG28 ℓ=80	1
ℓ33	9393-2805-07	Purple	UL1571 AWG28 ℓ=110	1
ℓ34	9393-2805-07	Purple	UL1571 AWG28 ℓ=165	1
ℓ36, ℓ35	9393-2805-08	Gery	UL1571 AWG28 ℓ=120	2
ℓ37	9393-2805-08	Grey	UL1571 AWG28 ℓ=190	1
ℓ38	9393-2805-08	Gery	UL1571 AWG28 ℓ=280	1
ℓ39	9393-2805-09	White	UL1571 AWG28 ℓ=35	1
ℓ40	9393-2805-09	White	UL1571 AWG28 ℓ=60	1
ℓ41	9393-2805-09	White	UL1571 AWG28 ℓ=100	1
ℓ42	9393-2805-09	White	UL1571 AWG28 ℓ=160	1
ℓ43	9393-3005-00	Black	UL1571 AWG30 ℓ=95	1
ℓ44	9393-3005-01	Brown	UL1571 AWG30 ℓ=100	1
ℓ45	9393-3005-02	Red	UL1571 AWG30 ℓ=95	1
ℓ46	9393-3005-02	Red	UL1571 AWG30 ℓ=100	1
ℓ48, ℓ47	9393-3005-02	Red	UL1571 AWG30 ℓ=135	2
ℓ50, ℓ49	9393-3005-03	Orange	UL1571 AWG30 ℓ=120	2

Lead wires list

Symbol	Part No.	Color	Typ.	Qty.
ℓ 51	9393-3005-04	Yellow	UL1571 AWG30 ℓ=85	1
ℓ 52	9393-3005-04	Yellow	UL1571 AWG30 ℓ=90	1
ℓ 53	9393-3005-04	Yellow	UL1571 AWG30 ℓ=95	1
ℓ 54	9393-3005-04	Yellow	UL1571 AWG30 ℓ=145	1
ℓ 55	9393-3005-05	Green	UL1571 AWG30 ℓ=95	1
ℓ 56	9393-3005-05	Green	UL1571 AWG30 ℓ=130	1
ℓ 57	9393-3005-06	Blue	UL1571 AWG30 ℓ=90	1
ℓ 58	9393-3005-06	Blue	UL1571 AWG30 ℓ=100	1
ℓ 59	9393-3005-07	Purple	UL1571 AWG30 ℓ=130	1
ℓ 60	9393-3005-08	Grey	UL1571 AWG30 ℓ=100	1
ℓ 61	9393-3005-09	White	UL1571 AWG30 ℓ=90	1
ℓ 62	9393-3005-09	White	UL1571 AWG30 ℓ=110	1
ℓ 63	9393-3005-09	White	UL1571 AWG30 ℓ=135	1
ℓ 64	9393-3003-00	Black	UL1354 AWG30 ℓ=130	1
ℓ 65	9393-3003-00	Black	UL1354 AWG30 ℓ=240	1
ℓ 66	8810-1086-01	Gery	UL2851 AWG32 ℓ=130	1

Above lead wires must be ordered in lengths rounded to nearest meter.
 上記リード線の供給は、1m 単位とします。

REPAIR GUIDE

■ The contents of this manual are in accordance with the assembly procedure. Therefore, follow the reverse procedure when disassembling.

■ Description of marks used in REPAIR GUIDE

- : Point of assembly and general caution
- Ⓔ : Grease used and part to be greased
- Ⓑ : Adhesive used and part to be glued

■ Assembly and Adjustment Procedure

- ① Exposure dial base plate/shoe assembly P. 1
- ② Flash head assembly (XE, P.C. board-B set, Main condenser, H case) P. 2
- ③ Main body assembly (P.C. board-A, -C, -E, -H) P. 3
- Voltage adjustment of Monitor lamp/circuit P. 4
- Auto/manual level adjustment P. 5 ~ P. 6
- ④ Outer parts assembly (Shoe block, P.C. board-D set, exposure dial base plate block) P. 7

■ Trouble-shooting Chart P. 8 ~ P. 14

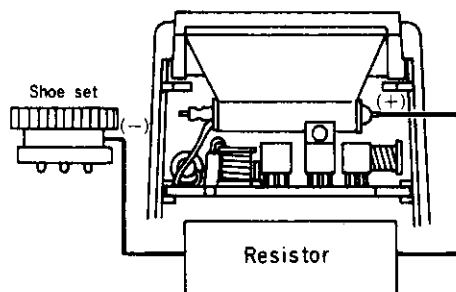
■ Measuring instruments, tools, subsidiary P. 15

■ Wiring diagram P. 16

■ Precautions

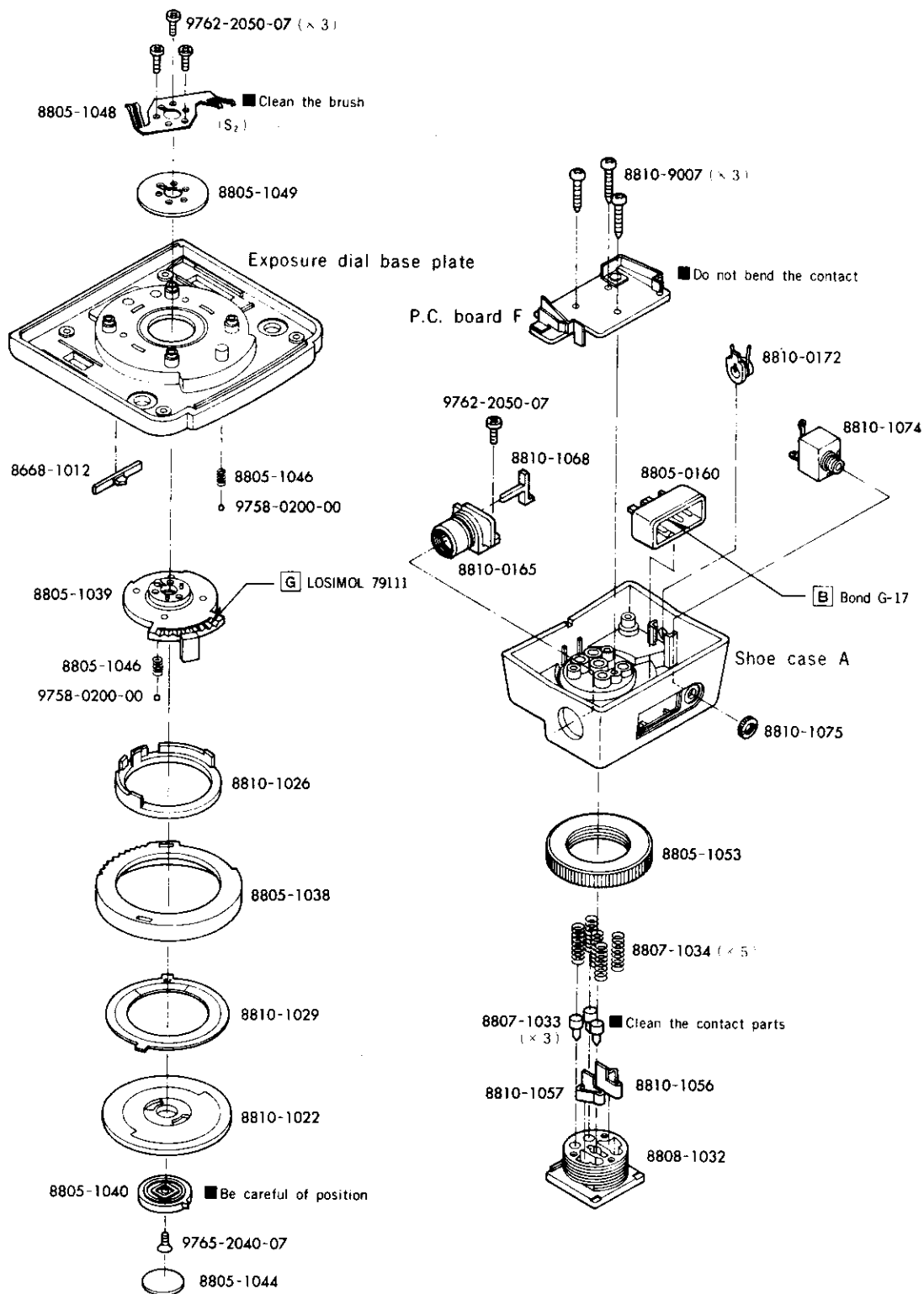
1. Since this electroflash uses many resin parts, use Flonsolve or Alcohol when cleaning. Never use Thinner, Ketone or Ethyl.
2. When disassembling, discharge the main condenser first in accordance with following procedure.

(Discharge procedure)



- Make shortcircuit using resistor (200-300/3W)
- Make sure that it is discharged completely.

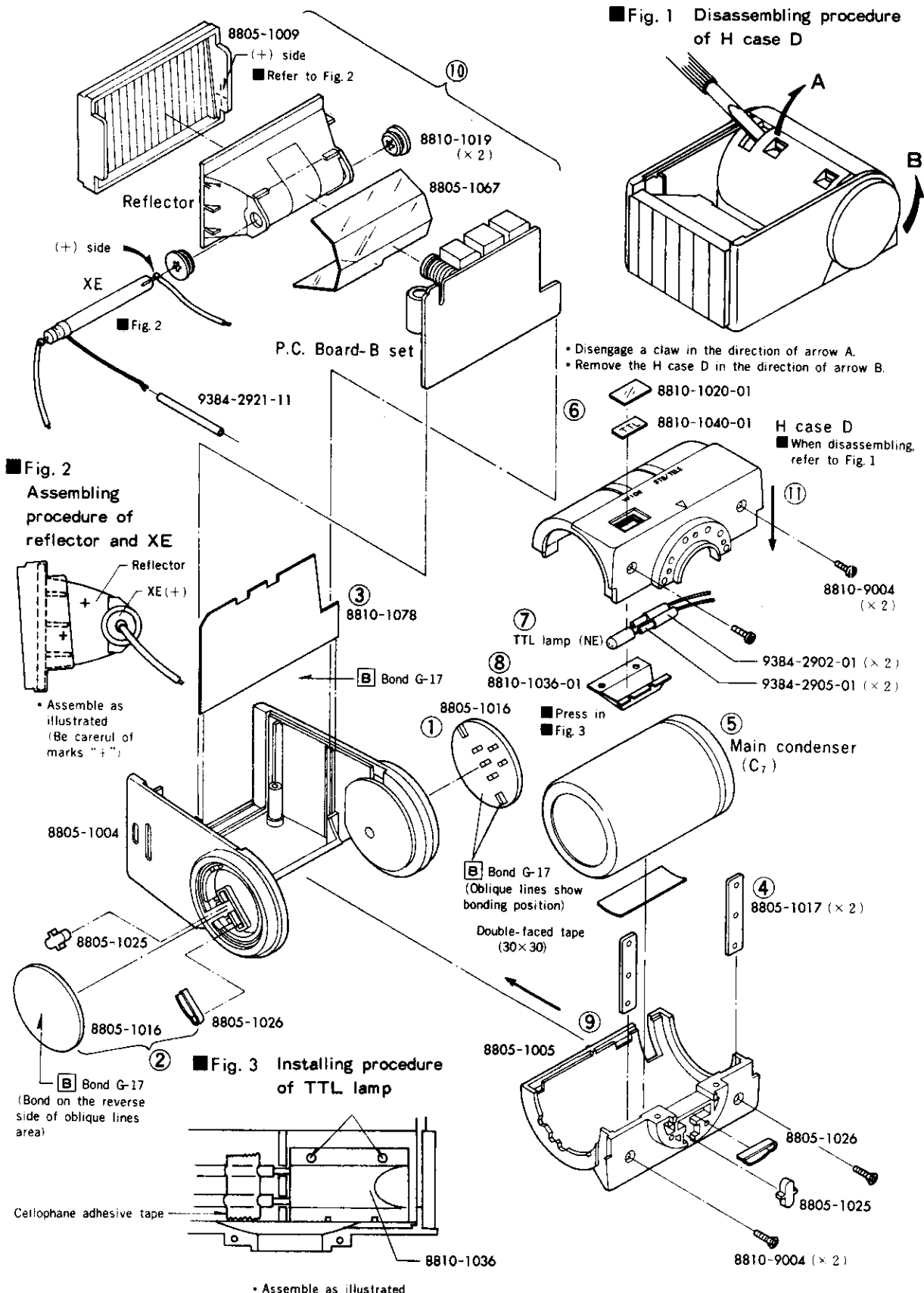
1 Exposure dial base plate/shoe assembly



2 Flash head assembly

■ Before disassembling, discharge the main condenser first (refer to P. 7)

■ Assemble the parts in the order of 1-11.

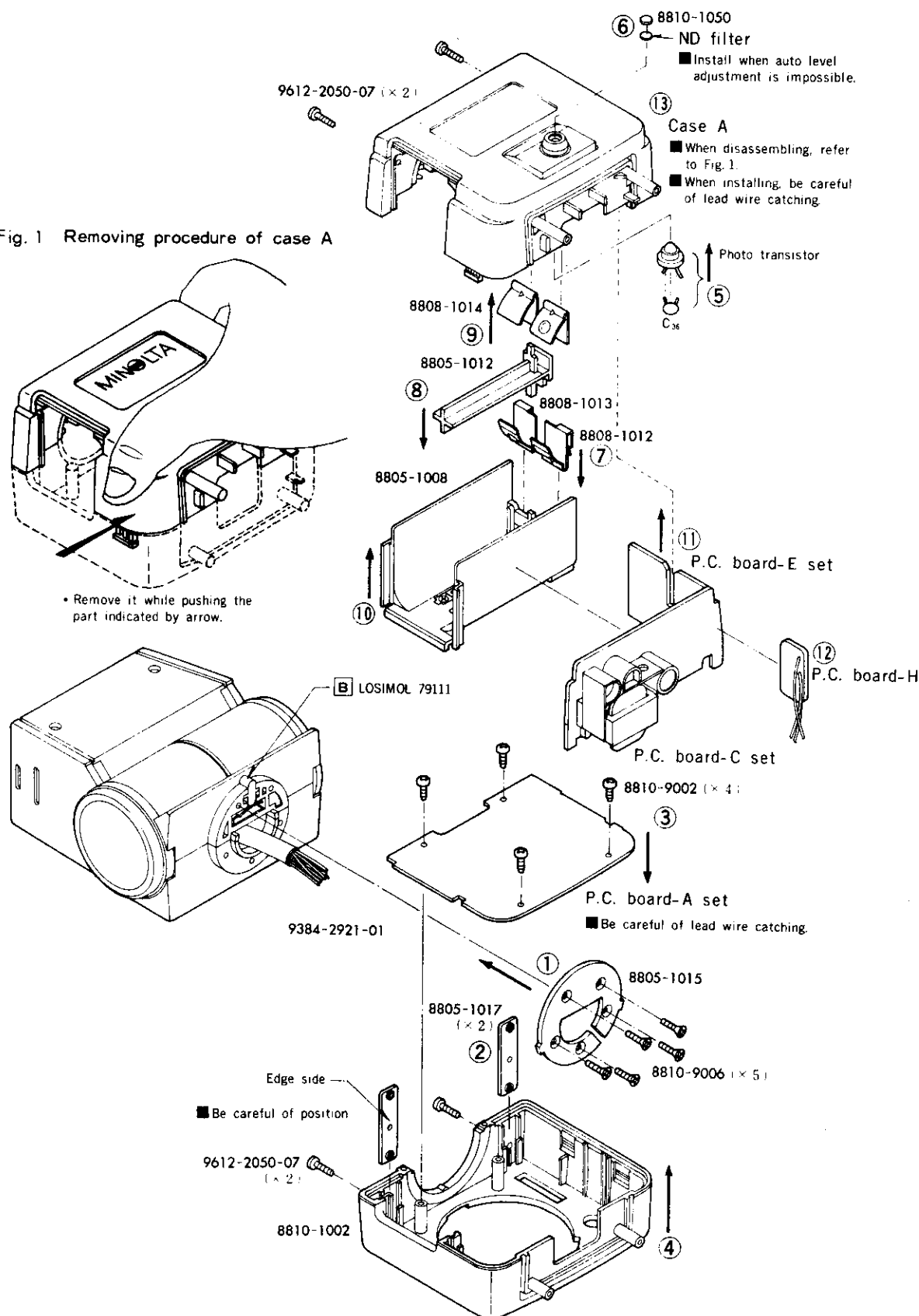


3 Main body assembly

■ Before disassembling, discharge the main condenser first.

■ Assemble the parts in the order of ① - ⑬.

■ Fig. 1 Removing procedure of case A

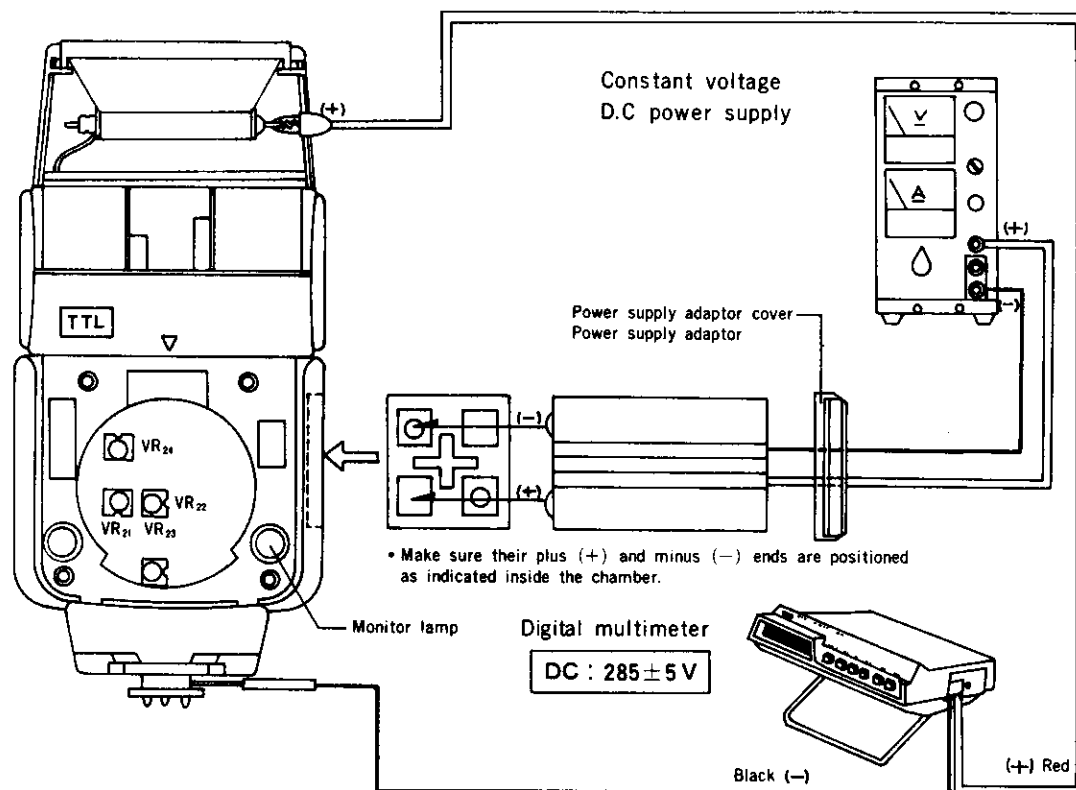


■ Voltage adjustment of Monitor-lamp/circuit

- Measuring instruments : Constant voltage D.C power supply (Model 524B, E-1, E-2)
 : Digital multimeter (Model 2508, 3476, 2507)
 : Power supply adaptor (8646-1034-79, 0461-1023-75)
 : Power supply adaptor cover (Refer to P.15)
 : Luminance correcting screwdriver-B

① Voltage adjustment of monitor lamp lighting

- Set the electroflash as follows :
 Mode selector : M
 Variable GN/power control : FULL
 Power switch : ON
- Set the measuring instruments as shown below :

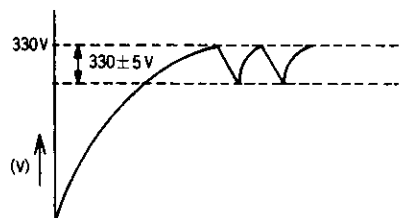


- Check that digital multimeter should indicate the value with in 285 ± 5 V when monitor lamp is lighted with flash-ready.
- When digital multimeter indicates the value out of 285 ± 5 V, adjust it turning VR_{23} .
 • Before the adjustment, flash the unit once without fail.
- Set the Variable GN/power control to "1/16", and make sure voltage of monitor lamp lighting is within the value 245~255 V.
 • If checking the voltage is not easy, reduce the input voltage.

② Voltage adjustment of monitor circuit

- Set the measuring instruments as shown above.
- Adjust the voltage of monitor circuit* turning VR_{22} when monitor circuit operates as flash ready to obtain within 330 ± 5 V.

*Functioning diagram of monitor cuircuit

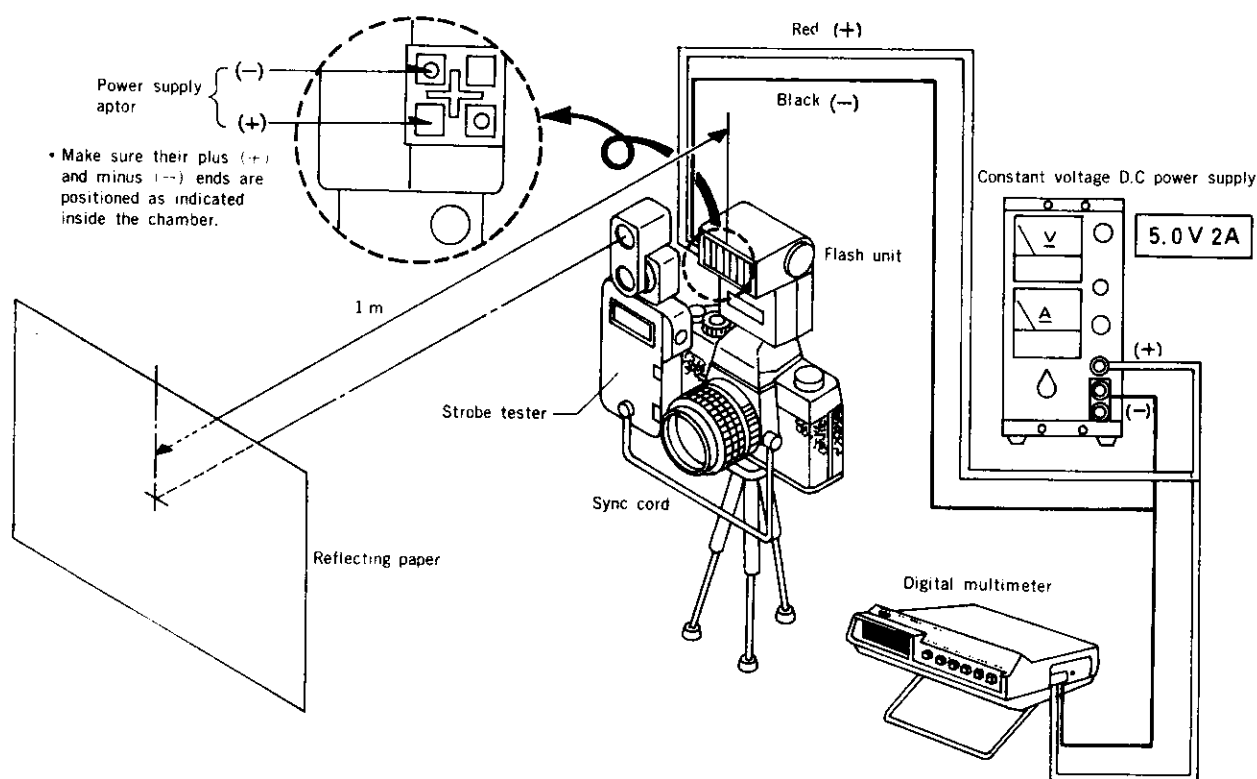


■ Auto/manual level adjustment

- **Measuring instruments:**
- : Constant voltage D.C power supply (Model 524B, E-1, E-2)
 - : Digital multimeter (Model 2508, 3476, 2507)
 - : Power supply adaptor (8646-1034-79, 0461-1023-75)
 - : Power supply adaptor cover (Refer to P.16)
 - : Luminance correcting driver-B
 - : Strobe tester (Model ST-III, ST-II, ST-I)
 - : Reflecting paper 1.3m × 2m (Superior Co. make, seamless paper #22)
 - : Tripod
 - : Camera (hot shoe type)
 - : Sync cord

1

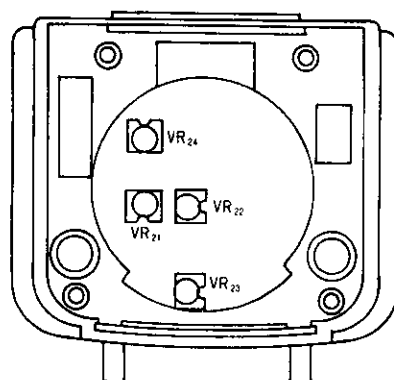
1. Set the Variable GN/power control to "FULL", ASA to "100" and turn ON the power switch.
2. Set the measuring instruments as shown below.



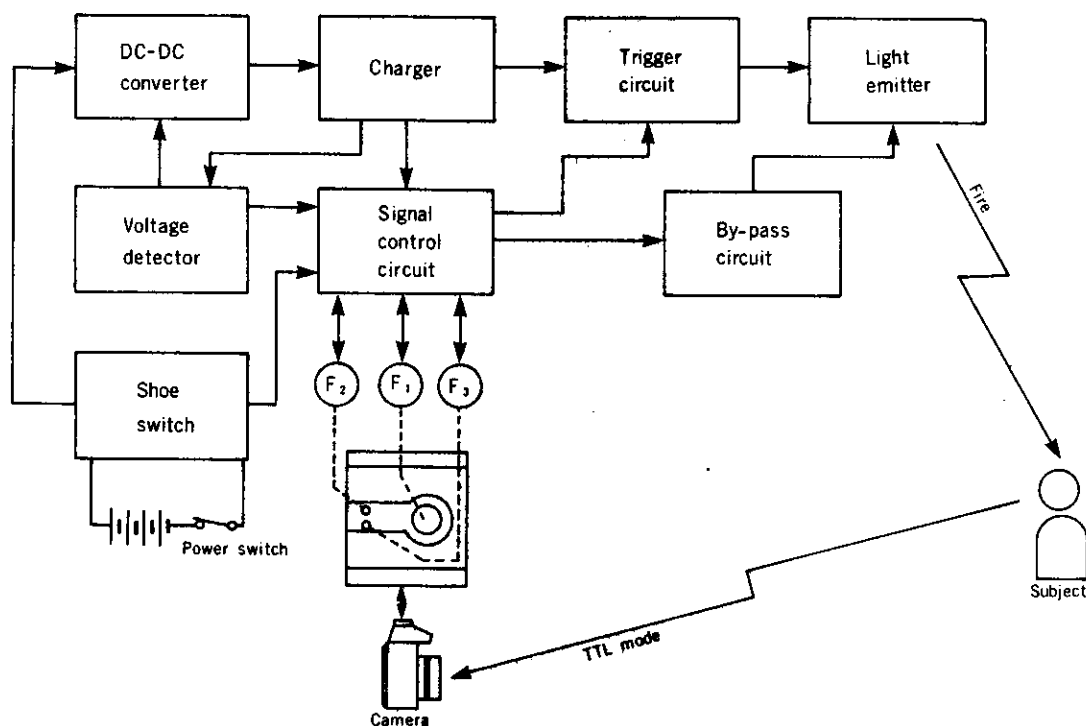
- Set the room light condition as dark as possible (lower than about 50 lx)
- **Strobe tester**

	Power switch	ON
ST-III	Measuring mode selector	CORD
	Mount the view finder 10°	
ST-II	Correction number scale	20
	ASA dial	80
ST-I	Measuring dial	1/30
	Mount the view finder 10°	

■ Fig. 2



■ Block description

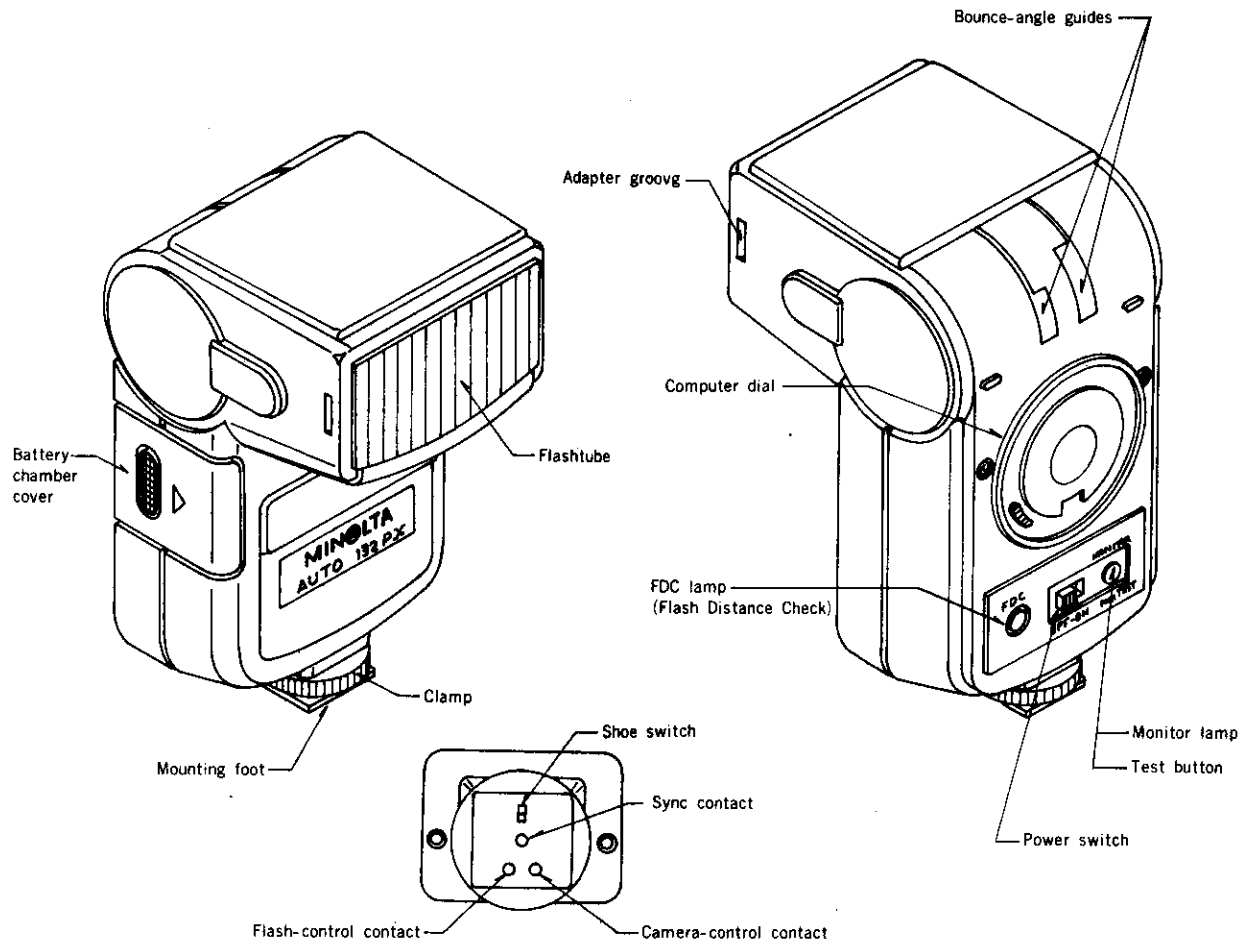


■ Block description

1. Battery power is converted by the DC-DC converter to high-tension current to the charger.
2. When the voltage of charger reaches the pre-determined level (approx. 285 V), monitor lamp lights up, Signal control circuit operates causing delivering of the signal to F₂. By this signal, shutter speed of the camera is changed to "X" automatically, flash ready viewfinder signal is indicated P flash signal is delivered from F₃.
3. When the voltage of the charger reaches the pre-determined level, the voltage detector functions to stop the operation of the DC-DC converter.
This makes the charger voltage constant (Monitor circuit).
4. With the camera shutter released, the X signal from F₁ enters the control signal output circuit, and the XE light-emitting signal is input to the trigger circuit.
This signal causes the trigger circuit to function for XE emission.
In case of that camera setting is in P mode.....Aperture setting is automatically.
In case of that camera setting is in A mode.....Desired aperture turning diaphragm scale ring.
5. The camera flash light detector receives reflected light from the subject, stop signal is generated when reflected light reaches to specified amount, stop signal to enters F₃ → signal control circuit → by-pass circuit, causing flash firing is stopped.
Then FDC lamp lights up, FDC signal from F₂ enters to camera, causing FDC indication in viewfinder blinks.
6. When detaching the electroflash from hot shoe, DC-DC converter is switched off automatically.

Mechanism Description

■ Names of Parts



■ INDEX

■ Block description	P. 1
■ Circuit Diagram	P. 2
■ Name/Function	P. 2

AUTO ELECTROFLASH 132PX

(8814)

Type

Program/any-aperture/manual clip-on Minolta Program System electronic flash unit with provisions for TTL off-film autoflash control by Minolta Direct Autoflash Metering with X-700 camera.

Guide number (ASA/ISO 100-m)

32 in meters at ISO 100/21° (52 in feet at ISO 25/15°)

Mode selection

By camera's mode/shutter-speed selector.

Program TTL : "P" on X-700 with MD lens at minimum aperture

Any-aperture TTL : "A" on X-700

Manual : Any other appropriate sync setting on above cameras or any appropriate sync setting on other cameras

Autoflash range

Program TTL : 0.7 to 7.1 m (2-1/3 to 23 ft.); actual range varies with aperture set by program

Any-aperture TTL : 0.7 to 22 m (2-1/3 to 72 ft.) at f/1.4

(minimum distance with flash used off camera: 0.06 m [2-1/2 in.] at f/16; all values given for ISO 100/21° with 50 mm f/1.4 lens)

Controls and indications

Computer dial with aperture (f/1.4 to 22) scale, flash-distance (meters, feet) scale, and click-stop film-speed (ISO-ASA 25 to 400) ring, with green bar showing typical program TTL range, and any-aperture TTL ranges and manual settings discernible at a glance; combination monitor lamp and open-flash/test button; FDC (Flash Distance Check) lamp

Bounce capability

90° upward from horizontal, with click-stops at both extremes and markings/click-stops at recommended minimum bounce angles for standard/telephoto (50°) and wideangle (65°) lenses; optional Bounce Reflector Set

Contacts

Direct electric contact for hot shoe; two spring-loaded electric contacts, one for signal from flash to give flash-ready indication and automatically set shutter speed for proper sync with X-700, XD- and XG-series Minolta SLRs, other for signal from Direct Autoflash Metering system of X-700 to control flash duration in TTL auto



Sufficient-exposure confirmation

Indicated in TTL auto by FDC (Flash Distance Check) lamp glowing for 2 sec. and viewfinder "60" LED blinking at 8 Hz for 1 sec. after exposure

Flashes/recycle time (sec.)

Alkaline-manganese : 140/9; nickel-cadmium : 60/4 (as determined by standard Minolta test method)

Flash duration

1/50,000 to 1/1,200 sec. in TTL auto; 1/1,200 sec. in manual

Color temperature

Balanced for daylight-type color film

Flash coverage

For lenses down to 35 mm focal length (on full-frame 35 mm), 28 mm with wideangle adapter W₁ (included), 24 mm with optional wideangle adapter W₂

Power

Four AA-size (penlight) 1.5 V alkaline-manganese or 1.2 V nickel-cadmium cells; power switch; special contact switch on mounting foot to automatically turn unit off when removed from hot shoe; charge-monitoring circuitry

Standard accessories

Snap-on wideangle adapter W₁, flash case

Optional accessories

Wideangle adapter W₂ (for coverage down to 24 mm), Color Filter Set (red, yellow, green, blue, A13 [85B] snap-on filters and ND 2×, ND 4× inserts); Cable OC, Off-Camera Shoe, Cable EX (for off-camera flash); Triple Connector, Cable OC, Cable EX, Off-Camera Shoe (for multi-flash); Bounce Reflector Set; Ni-Cd Charger NC-2 with batteries

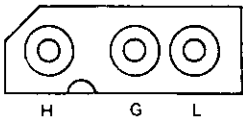
Dimensions

114 (H) × 70 (W) × 66 (D) mm (4-1/2 × 2-3/4 × 2-5/8 in) overall with flash head forward

Weight

235 g (8-5/16 oz.) without batteries

Items	Description
Monitor circuit voltage	<ul style="list-style-type: none"> • Voltage of monitor circuit should be within 330 ± 5 V under following conditions : Variable GN/power controlFULL Power supply5.8 V
A.P.O function	<ul style="list-style-type: none"> • Power supply should stop 1024 sec. ($\pm 15\%$) after monitor lamp ON. • Power supply should stop 1024 sec. ($\pm 15\%$) after one of the following conditions while monitor lamp ON. Power switchON→OFF→ON FDCPush Test buttonPush X contactON • Power supply stopping by A.P.O function should be released under one of the above conditions. <p>NOTE: To check A.P.O function, use Constant Voltage D.C power supply (5.8 V).</p>
Current consumed	<ul style="list-style-type: none"> • 15 min. after monitor lamp ON$20 \mu\text{A}$ or less (Power supply : 5.8 V Power switch : ON)

Items	Description
Accessory terminal	<ul style="list-style-type: none"> Accessory terminal can be connected with Off-Flash Sensor, Cable-OC, Cable-EX or Cable-CD.
Sync cord terminal	<ul style="list-style-type: none"> Sync cord can be connected.
External power input	<ul style="list-style-type: none"> External power input can be connected with PG-2 or AC Adapter 4. Flash unit should be charged when applying 330 V between H and G, 6 V between L and G. 
Computer dial	<ul style="list-style-type: none"> Each dial should operate smoothly with proper click stop. ASA film-speed ring should click-stop by 1/3 step from ASA 25 to 400, aligning the red dot with ASA index. Flash range should be varied by Variable GN/power control changing.
Bounce	<ul style="list-style-type: none"> Flash head should be tilted up to 90° from horizontal and/or rotated up to 90° to left or right. Angle should be varied with proper click-stop at following steps : <ul style="list-style-type: none"> Upward 0°, 50°, 65°, 90° Downward 0°, 30°, 45°, 60°, 75°, 90°
Battery chamber	<ul style="list-style-type: none"> With battery inserted, spring pressure of battery contact should be proper. With normal vibrations or impacts, there should be no possibility of contact failure. With wrong insertion, flash unit should not function, should not be influenced.


■ Performance

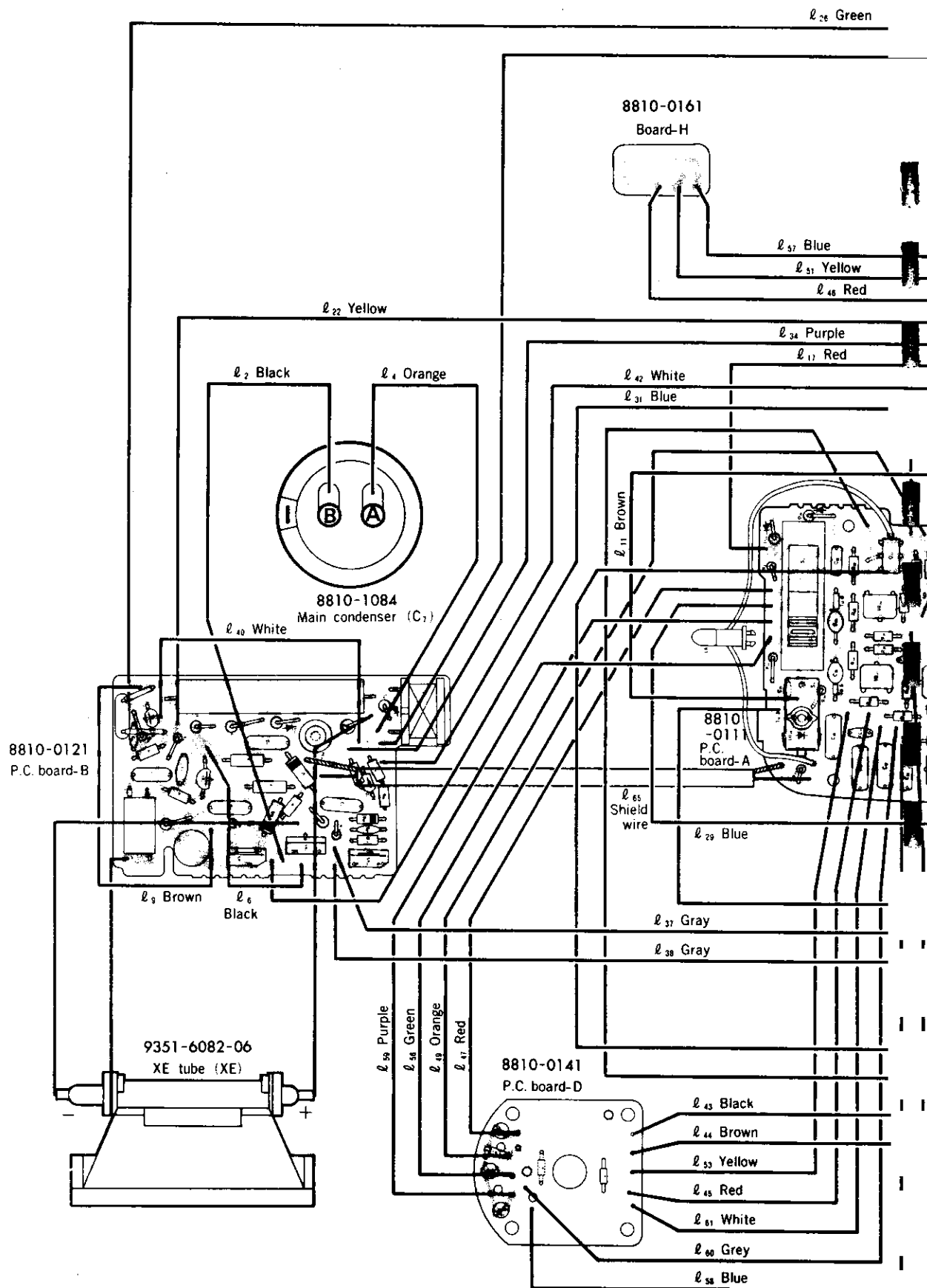
Items	Description										
Guide number	<div>● Main condenser : 330 V</div> <table><tr><th>Variable GN/power control</th><th>GN</th><th>Variation</th></tr><tr><td>FULL</td><td>$36^{+0.4}_{-0.6}$EV</td><td rowspan="3">Within 0.3 EV</td></tr><tr><td>1/4</td><td>$18^{+0.4}_{-0.6}$EV</td></tr><tr><td>1/16</td><td>$9^{+0}_{-0.7}$EV</td></tr></table>	Variable GN/power control	GN	Variation	FULL	$36^{+0.4}_{-0.6}$ EV	Within 0.3 EV	1/4	$18^{+0.4}_{-0.6}$ EV	1/16	$9^{+0}_{-0.7}$ EV
Variable GN/power control	GN	Variation									
FULL	$36^{+0.4}_{-0.6}$ EV	Within 0.3 EV									
1/4	$18^{+0.4}_{-0.6}$ EV										
1/16	$9^{+0}_{-0.7}$ EV										
Recycle time	<div>● Monitor lamp should light within 14.0 sec. under following conditions :</div> <div>Variable GN/power controlFULL</div> <div>Power supply5.8 V, 0.7Ω, more than 15 A</div>										
Voltage of monitor lamp lighting	<div>● Monitor lamp should light under following conditions :</div> <div>Variable GN/power controlFULL</div> <div>Power supply5.6 V</div> <div>Voltage of main condenser285± 5 V</div>										

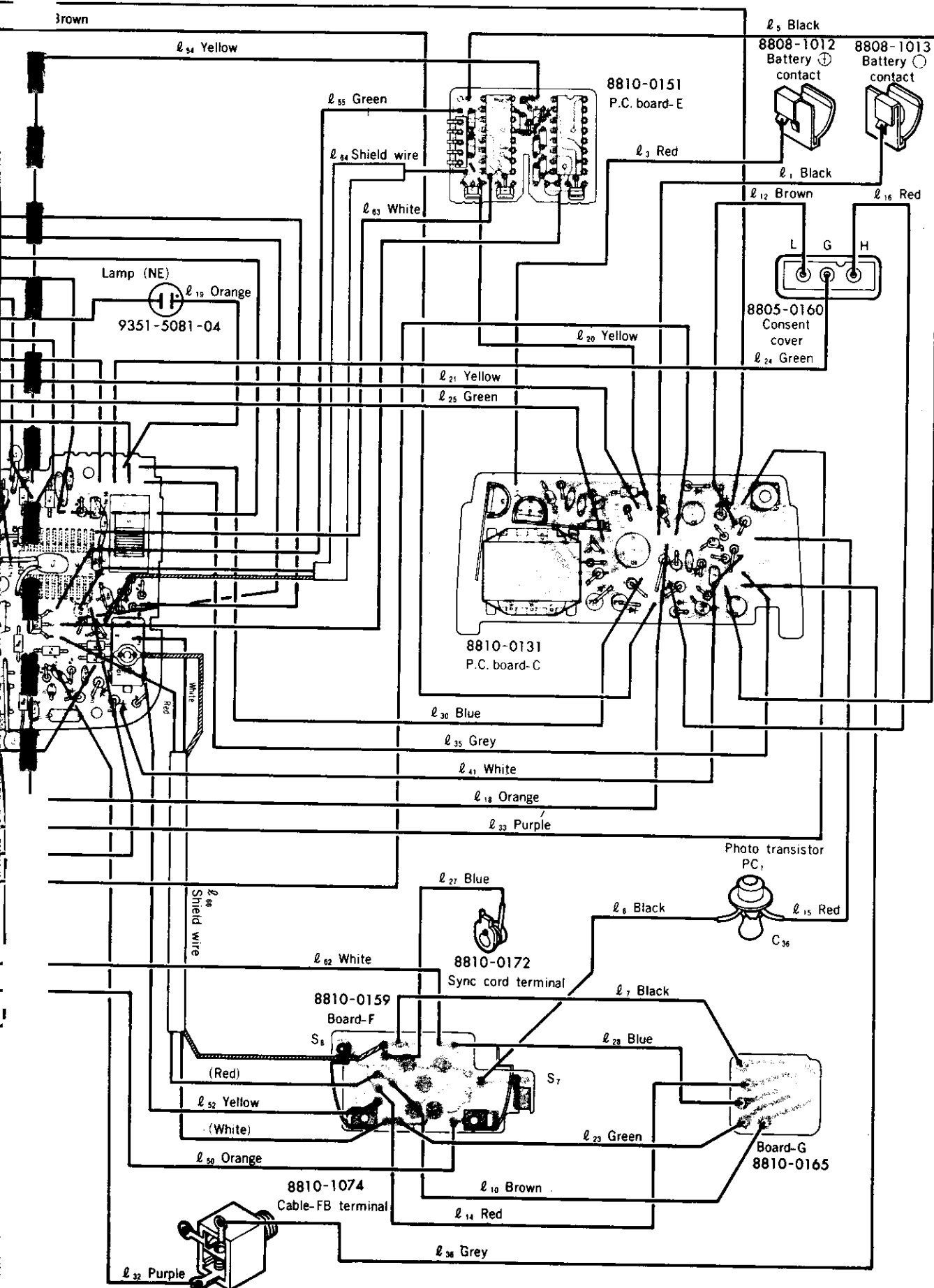
Inspection Standard

1. This standard specifies uniform performance levels for servicing in order to guarantee our product's quality to customers. Each item is detailed so that you can follow this standard when you receive inquiries from users or are asked for checks.
2. When delivery or acceptance inspections are required, do not directly apply this standard to the performance measurements, but refer to the corresponding standard (manual).
3. Some users, because of their taste or special purposes, may require adjustment of this standard. In this case, perform the adjustment according to the user's request whenever possible.

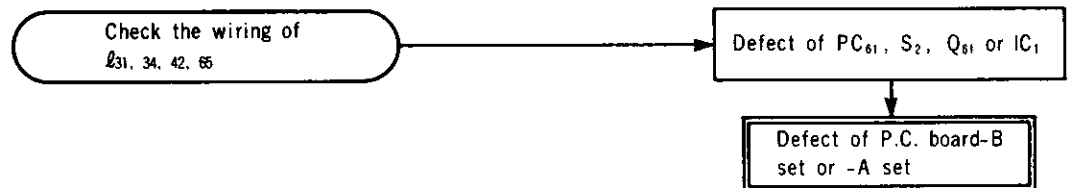
■ Performance

Items	Description
Monitor lamp	<ul style="list-style-type: none"> ● Red lamp should light when flash is ready to fire. ● Red lamp should go off when power switch is OFF.
FDC lamp	<ul style="list-style-type: none"> ● Green lamp should light for about 2 sec. in TTL and Sensor Auto modes if exposure is correct.
Setting aperture LED indication	<ul style="list-style-type: none"> ● In Sensor Auto mode, Red LED corresponding to ASA range should light, and it should go off when power switch is OFF. ● Arrangement.....Number 2, 4 or 8 should be inside the LED illumination at ASA 50 setting.
Power switch	<ul style="list-style-type: none"> ● Power switch should be ON and red mark should appear when sliding it upwards. ● When using PG-2, PG-2 and main body should function by power switch ON. <p>With power switch OFF, both units should not function.</p> <div style="text-align: center;">  </div>
Mode selector	<ul style="list-style-type: none"> ● Mode selector should click properly, and each click stop should show the mode clearly. ● Mode changing stiffness for TTL mode should be tough as compared with the other modes. ● "TTL" should be indicated when setting TTL mode.
Variable GN/power control	<ul style="list-style-type: none"> ● Power level should be varied in 9 steps having click stops in both modes, Auto and M. ● With power level changing, computer dial and flash range should be interlocked.
Test button	<ul style="list-style-type: none"> ● Test button should operate smoothly without catching, and should return to original position with finger off. ● Flash should fire properly without chattering when pushing test button while monitor lamp is ON.
Dial light button	<ul style="list-style-type: none"> ● Dial light button should operate smoothly without catching, and should return to original position with finger off. ● Computer dial should be illuminated when button is pushed with power switch ON.
Cable-FB terminal	<ul style="list-style-type: none"> ● Shortcircuiting Cable-FB terminal should make flash unit operate even though A.P.O functions. <p>Opening the circuit should not make flash unit operate at all.</p>

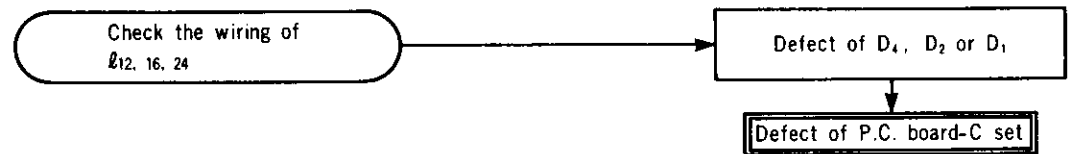




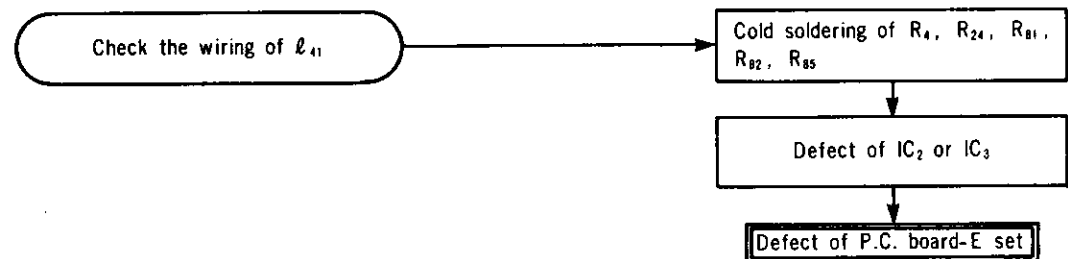
8. Fired fully in Manual Lo (1/16) setting/limited firing in Manual Hi (FULL)



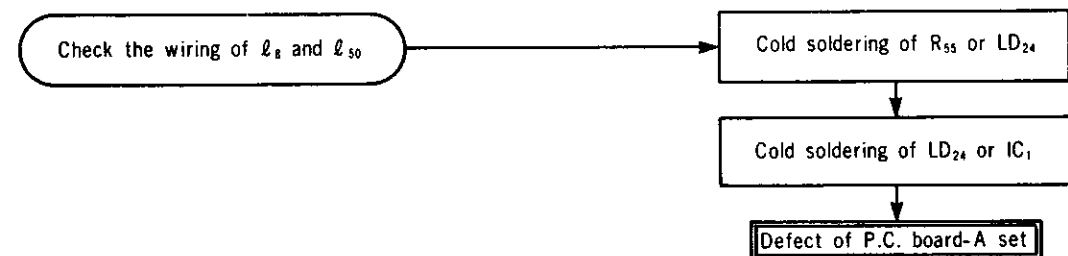
9. No supplying of external power supply



10. A.P.O circuit does not work



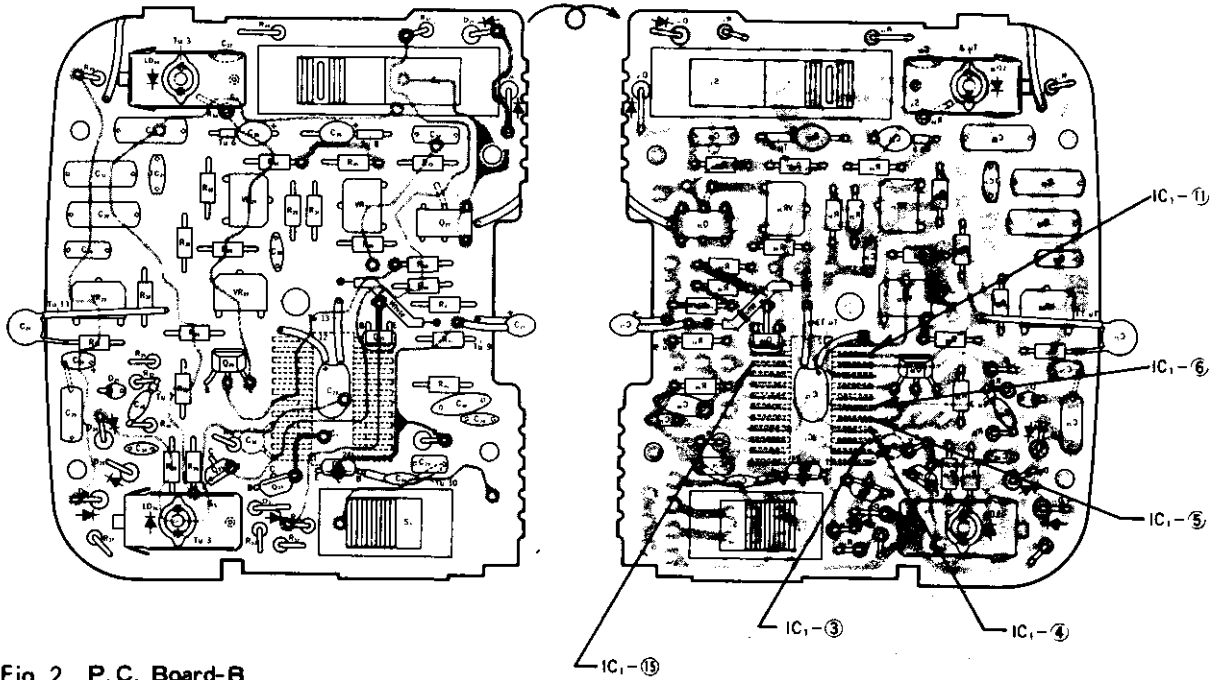
11. FDC does not work



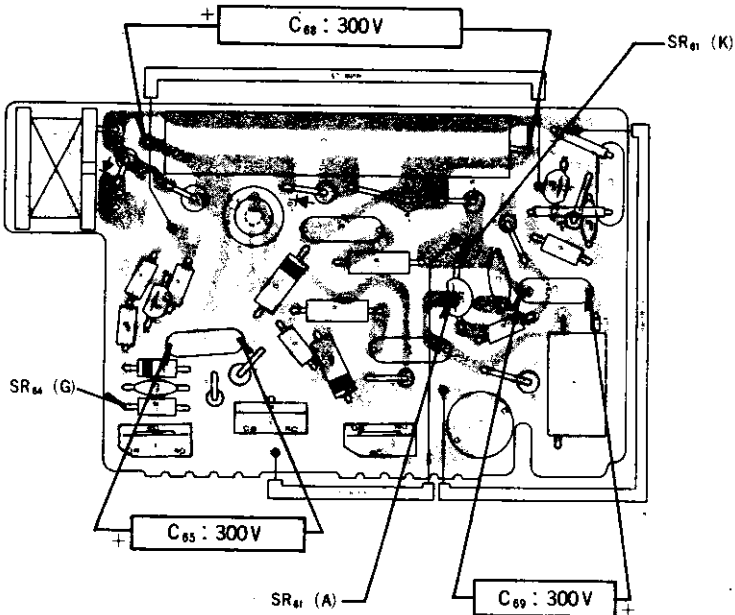
Precautions

- When measuring voltage, printed wiring you can touch is only designated one, since measuring position is limited.
- When voltage check, connect (-) end of tester with (-) end of battery source.

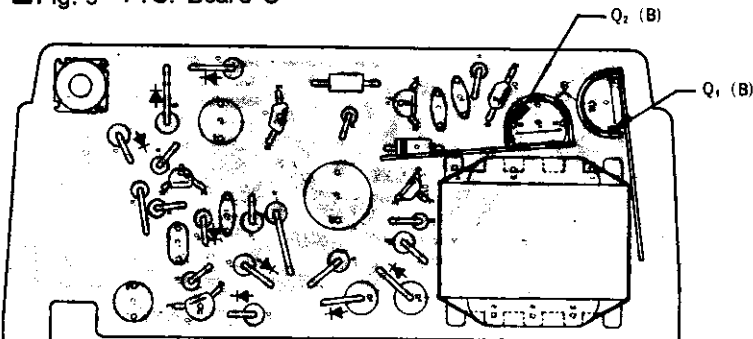
■ Fig. 1 P.C. Board-A



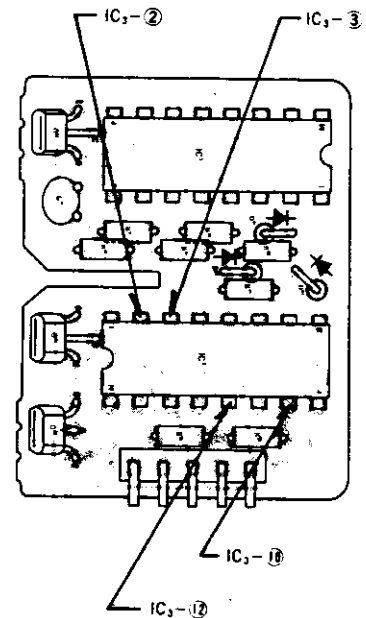
■ Fig. 2 P.C. Board-B



■ Fig. 3 P.C. Board-C



■ Fig. 4 P.C. Board-E



■ Subsuduary materials

■ Grease

- Losimol 79111

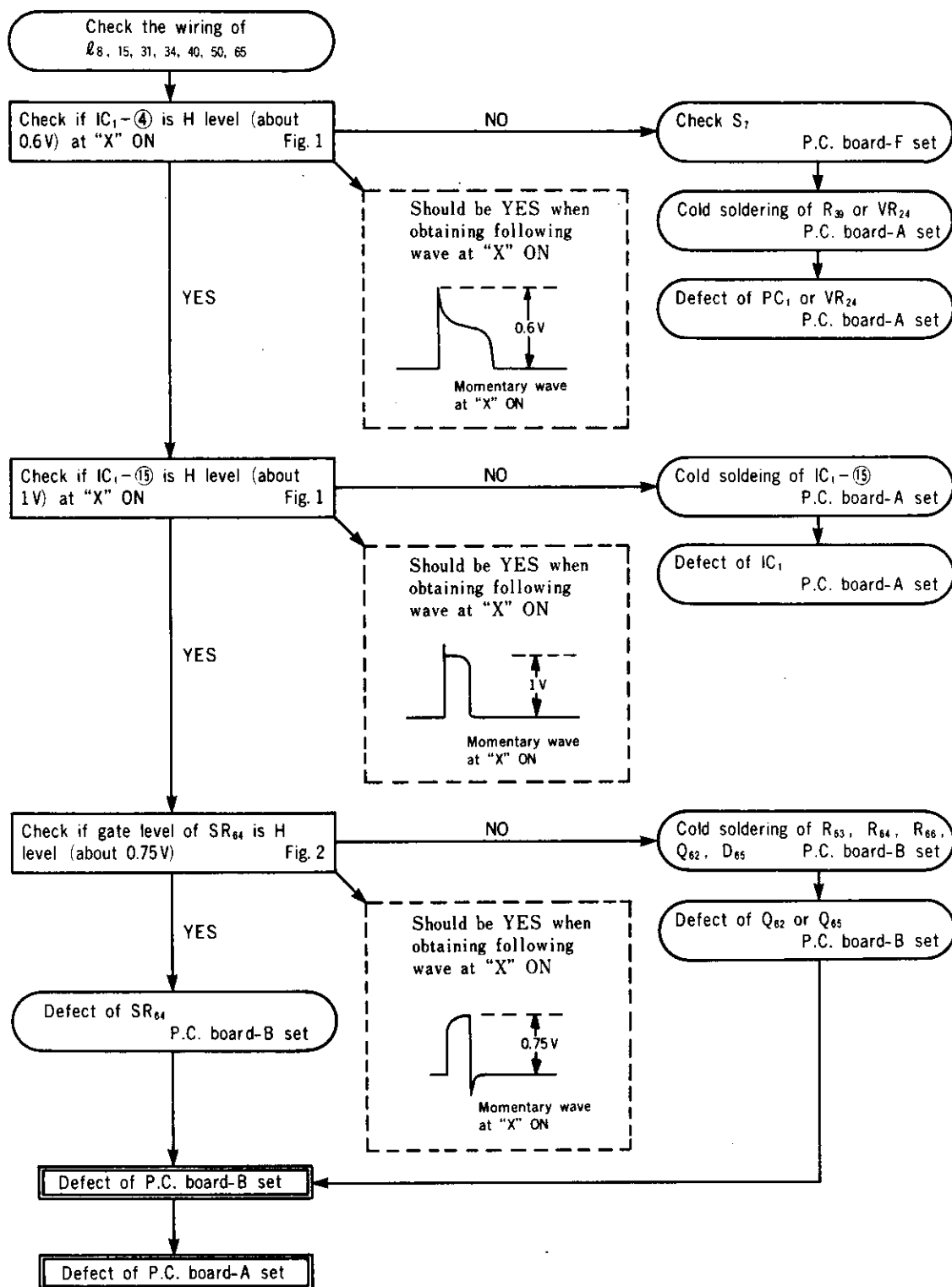
■ Adhesive agents

- Bond G-17

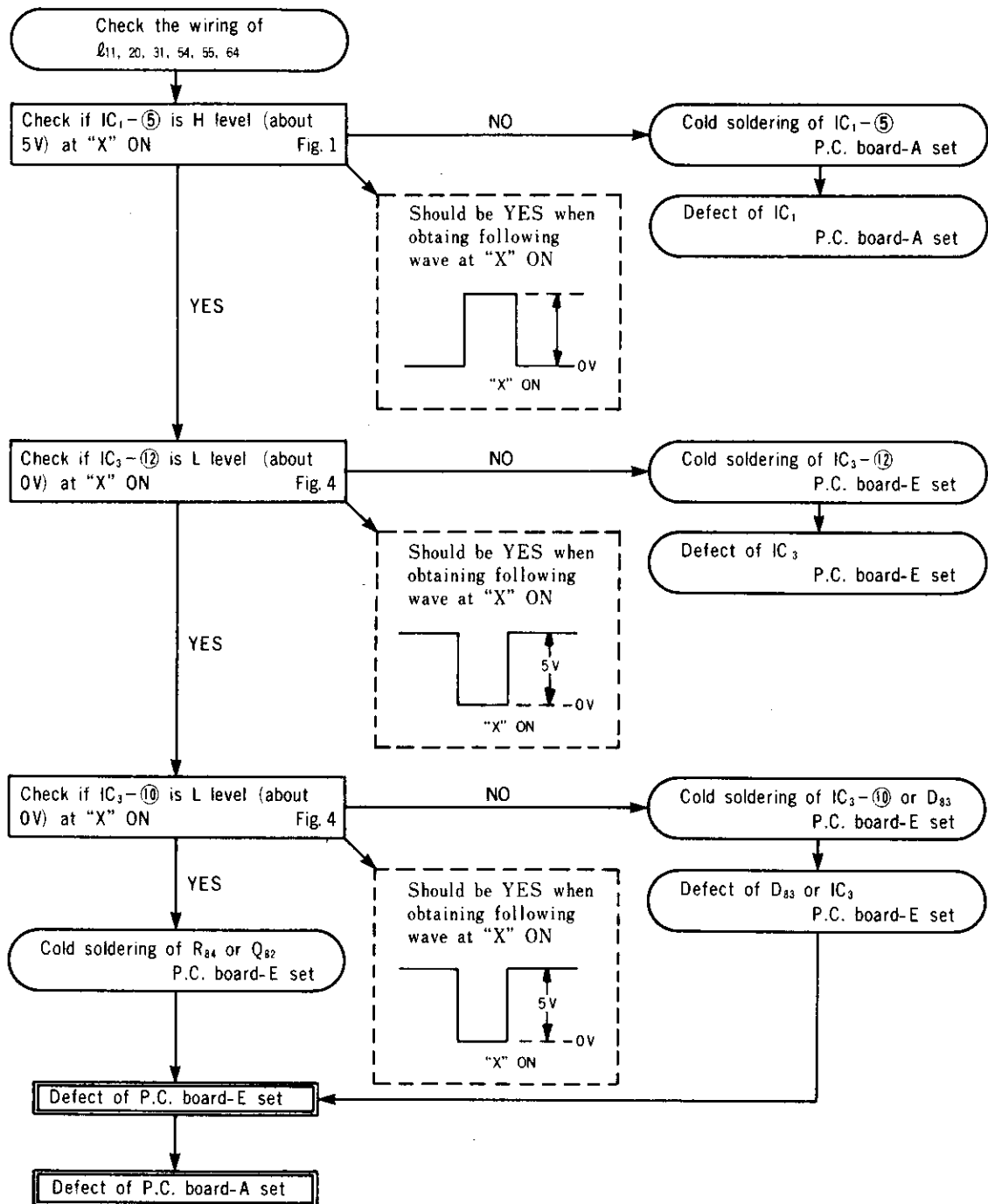
■ Cleaner

- Flonsolve

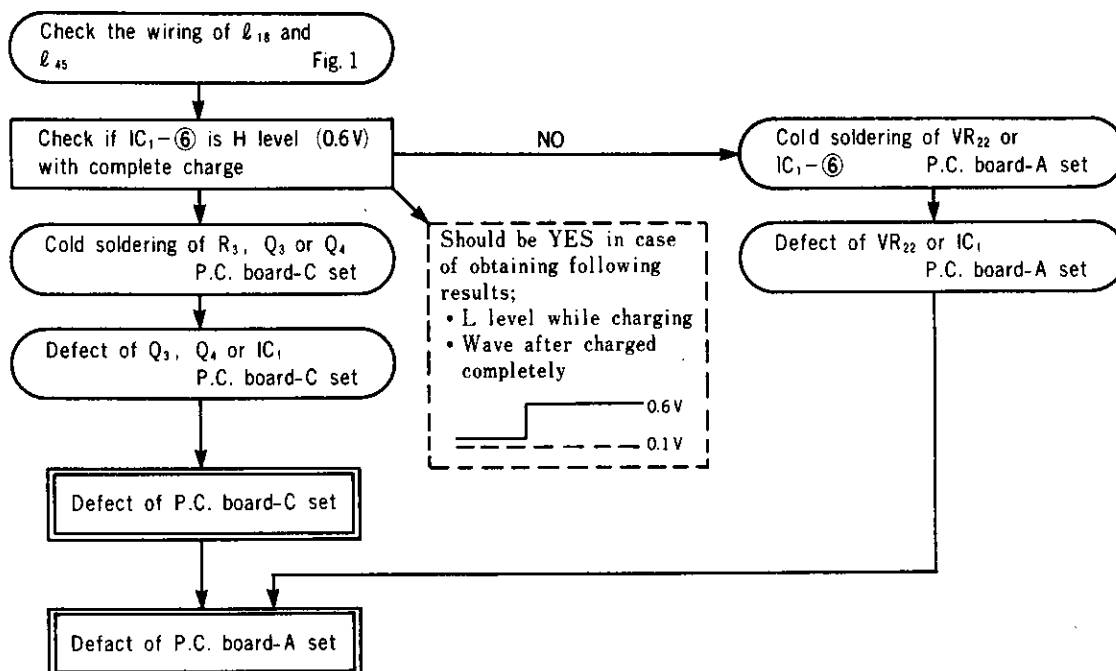
7. Fired fully in Auto mode



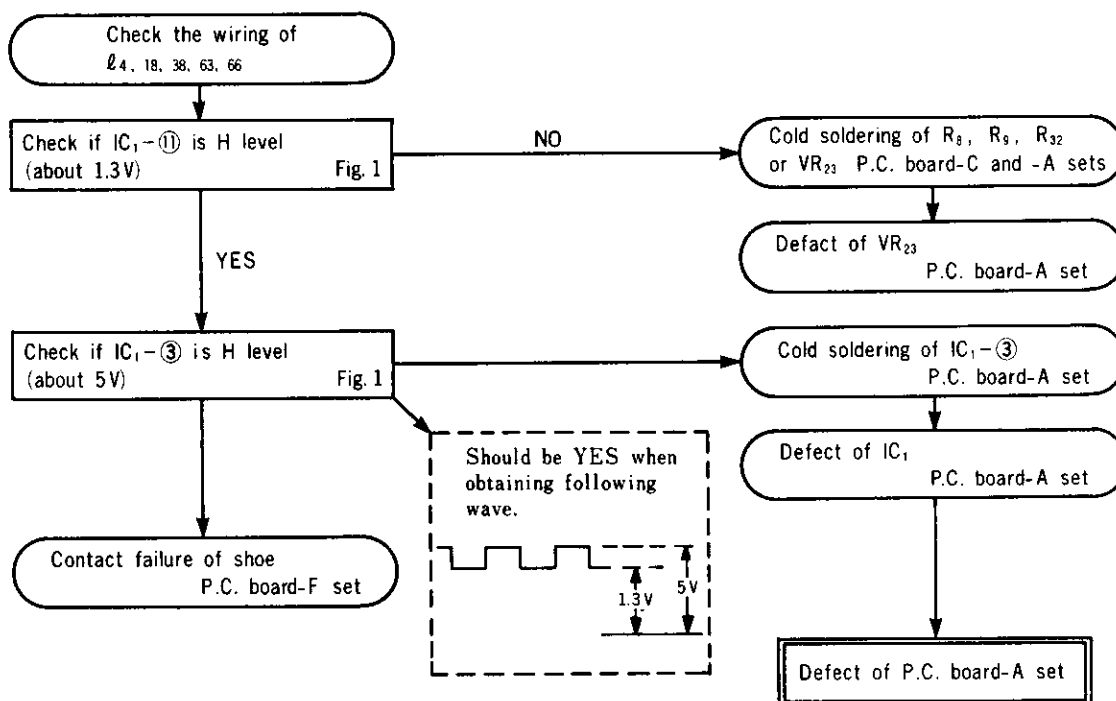
6. Fired fully in TTL mode



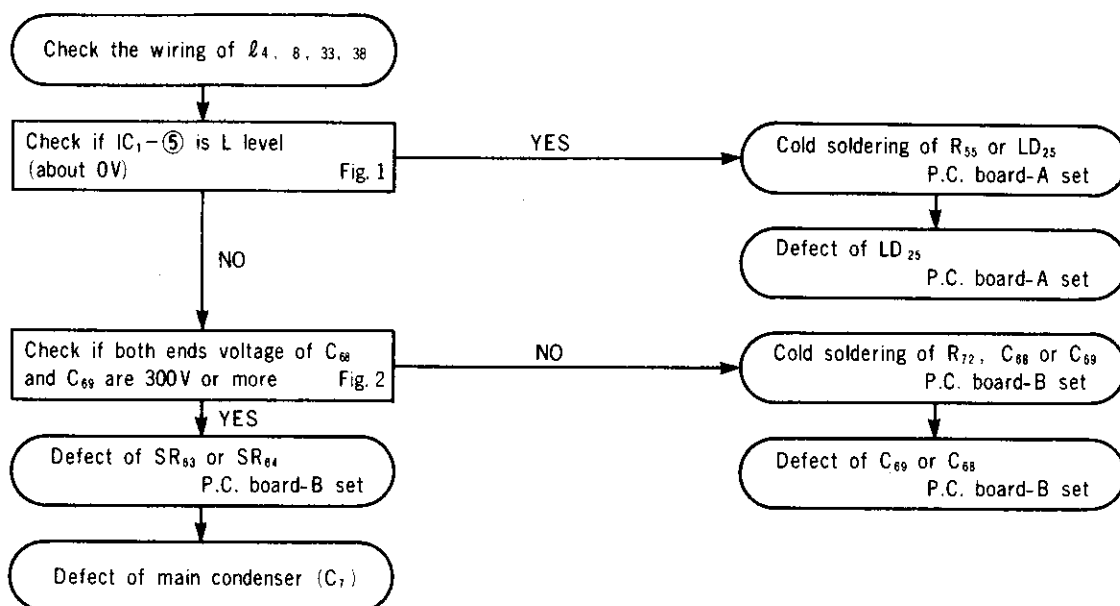
4. Monitor circuit does not work (Oscillation sound remains ON with C_7 voltage 330V or more)



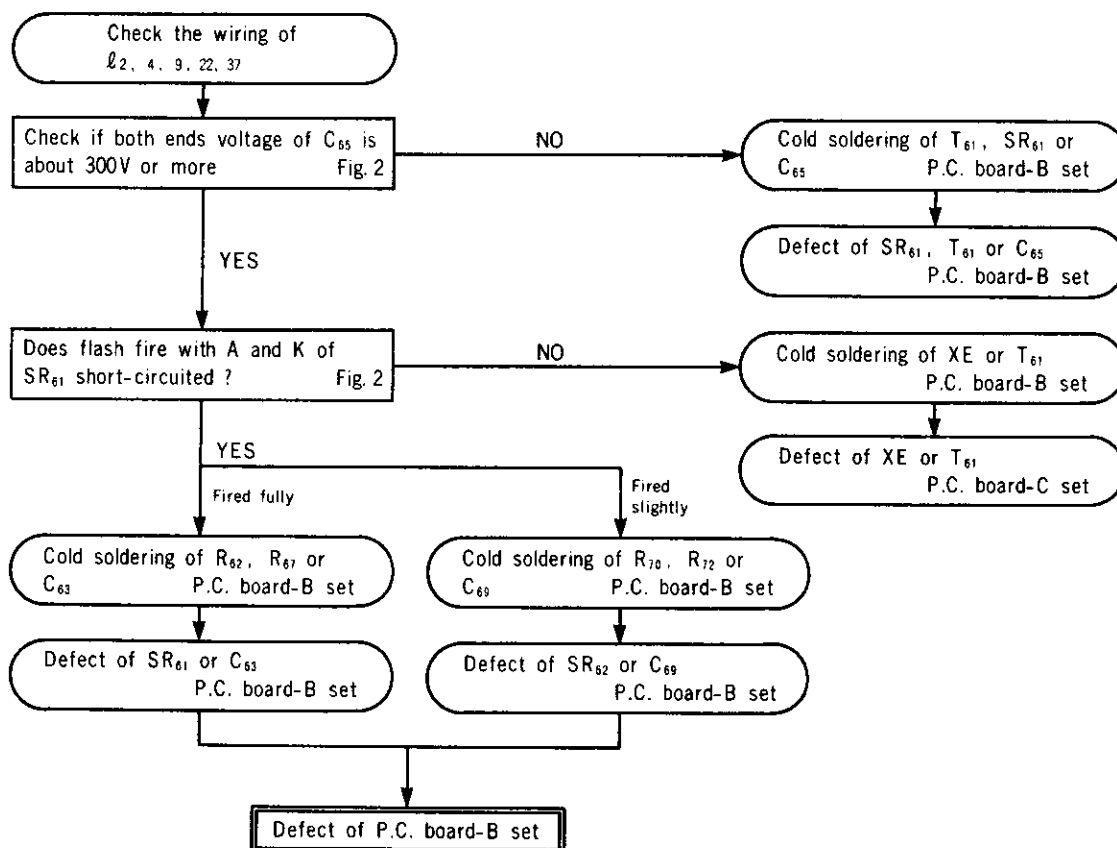
5. Flash-ready signal



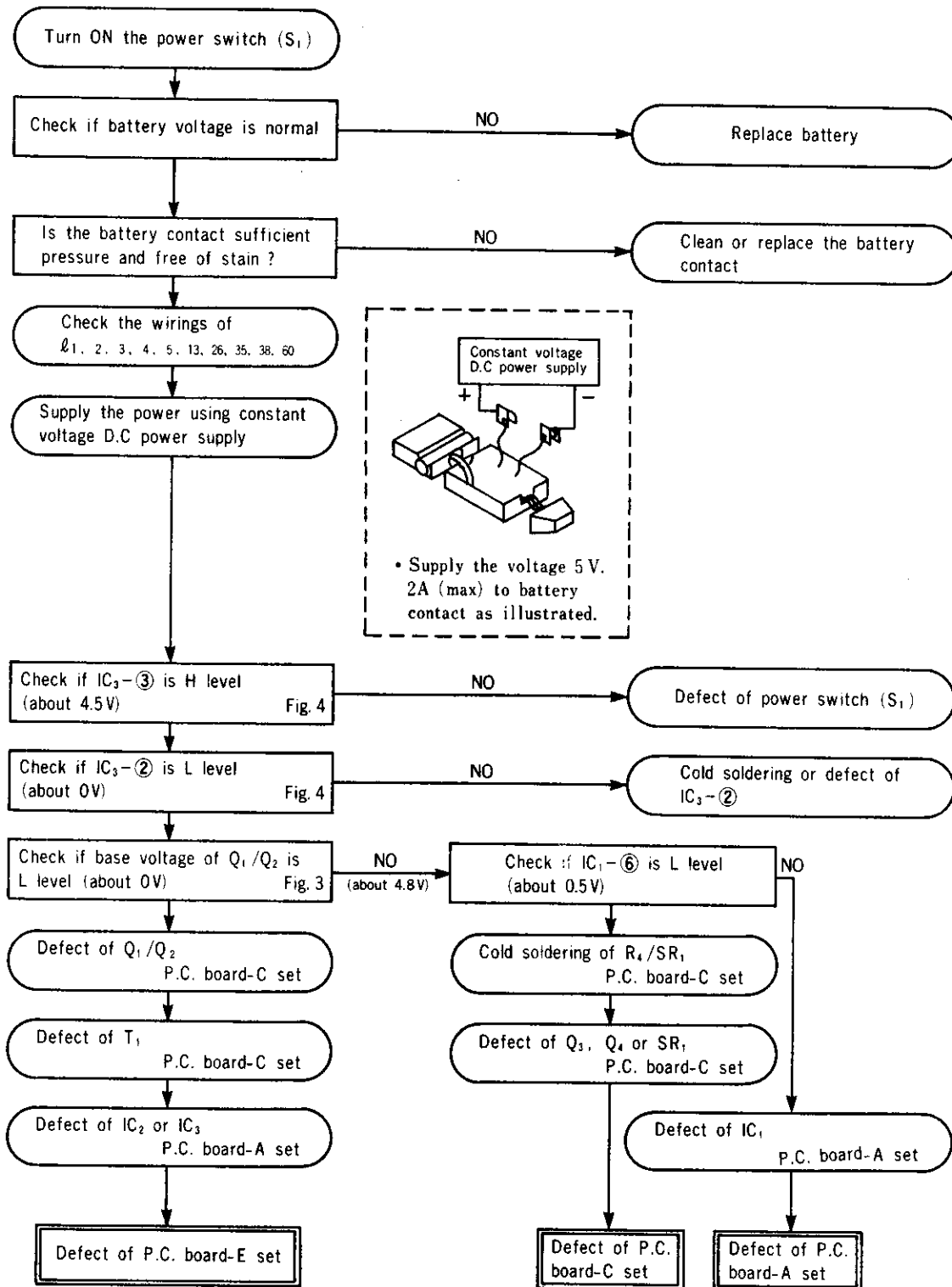
2. Monitor lamp does not light up



3. No flashing (Voltage of C₇ is 300V or more)



1. No oscillation sound



Trouble-Shooting Chart

1. General

1. This chart includes symptoms and causes of troubles on the Auto electro flash 360PX.
2. When voltage check, connect (—) end of tester with (—) end of battery source.
3. This chart will be useful with reference page (P. 4).

2. Contents of chart

1. Described in this chart are only the single causes of trouble, which cannot cover all possibilities.
For trouble involving combined causes, make overall investigations with reference to the individual causes.

3. Precautions

1. The digital tester (type 2507) should basically be used for measuring. Other instruments can also be used, if their input impedance is 10 M ohms or more.
2. To check voltage, use the specified measuring instrument.
For continuity check use tester (less than 3 V), and for wave check, oscilloscope.
3. IC, diode, transistor, resistor, condenser, etc. may cause almost no trouble. Therefore, check trouble with an emphasis on soldering of leads, electrical parts, and switch mechanisms.
4. For lead wire check, refer to wiring diagram on P. 16.
5. When measuring voltage, printed wiring you can touch is only designated one, since measuring position is limited.
6. When disassembling, discharge the main condenser (C_7) in accordance with procedure (Refer to P. 7 Fig. 1).
7. Keep the soldering iron temperature at $300 \pm 10^\circ \text{C}$. If impossible, solder in a short time as much as possible.
(It is desirable to use a soldering iron with a grounding wire attached, or a ceramic heater type soldering iron.)

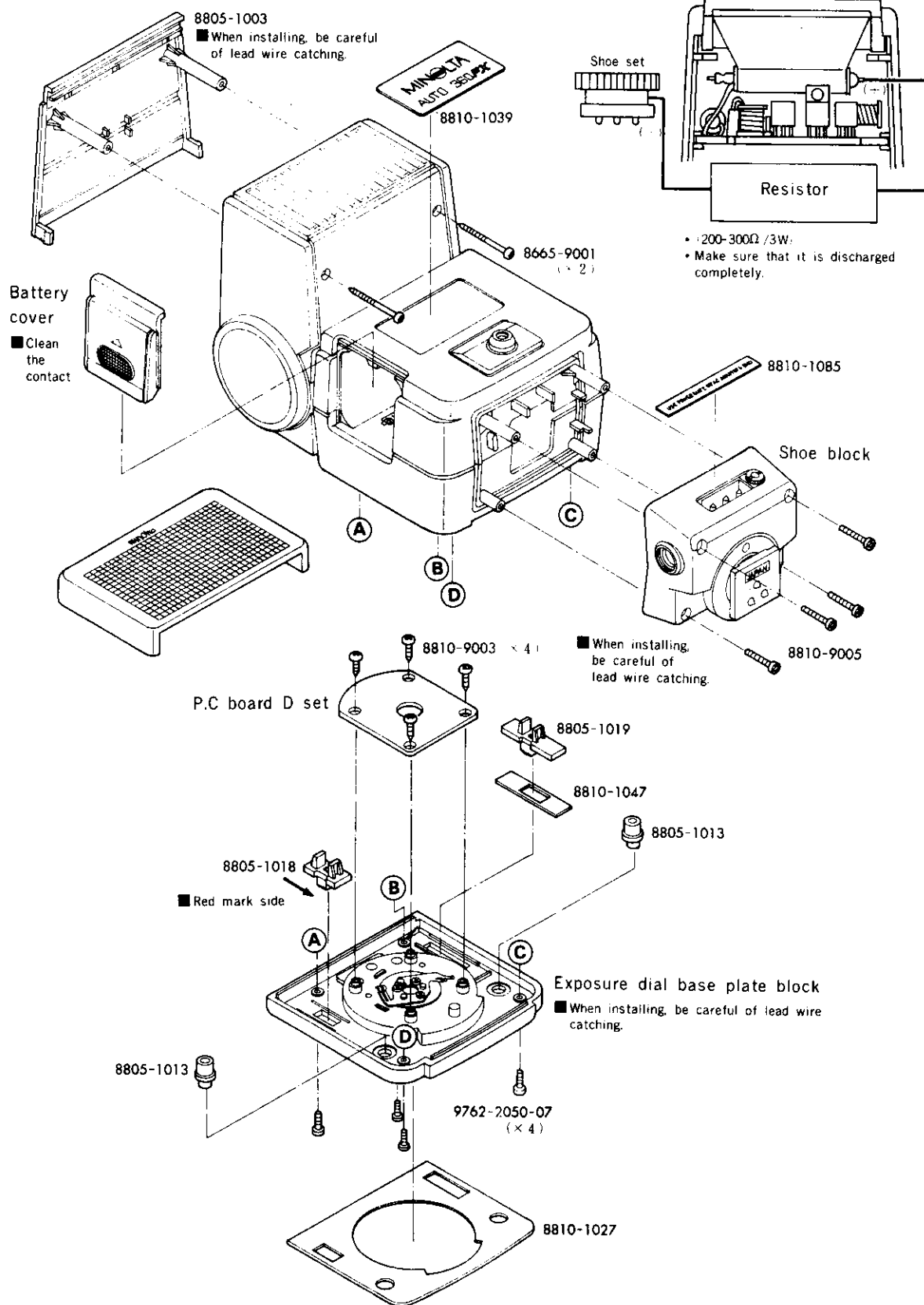
4. INDEX

■ 1. No oscillation sound	P. 9
■ 2. Monitor lamp does not light up	P. 10
■ 3. No flashing (Voltage of C_7 is 300V or more)	P. 10
■ 4. Monitor circuit does not work (Oscillation sound remains ON with C_7 voltage 330V or more)	P. 11
■ 5. Flash-ready signal	P. 11
■ 6. Fired fully in TTL mode	P. 12
■ 7. Fired fully in Auto mode	P. 13
■ 8. Fired fully in Manual Lo (1/16) setting/limited firing in Manual Hi (FULL)	P. 14
■ 9. No supplying of external power supply	P. 14
■ 10. A.P.O circuit does not work	P. 14
■ 11. FDC does not work	P. 14

4 Outer parts assembly

■ Before disassembling, discharge the main condenser first as Fig. 1

■ Fig. 1 Discharge procedure of main condenser



3. Measure the auto level 30 sec. after monitor lamp ON.

In case that auto level is out of standard, adjust it turning VR_{24} shown in Fig.2 with mode selector set as F 5.6.

(ASA 100)

	Mode selector	Standard
Check	F 5.6	F 5.6 $\begin{smallmatrix} +0.7\text{EV} \\ -0.5\text{EV} \end{smallmatrix}$
Adjustment	F 2.8	F 2.8 $\begin{smallmatrix} +0.7\text{EV} \\ -0.5\text{EV} \end{smallmatrix}$
	F 11	F 11 $\begin{smallmatrix} +0.7\text{EV} \\ -0.5\text{EV} \end{smallmatrix}$

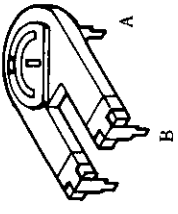
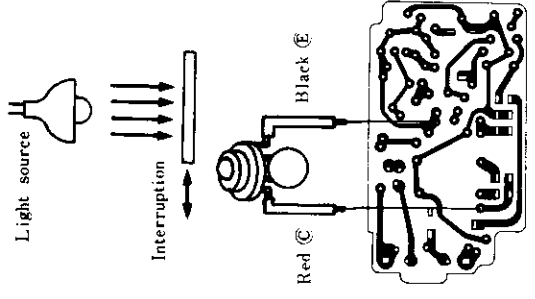
2 Manual level adjustment


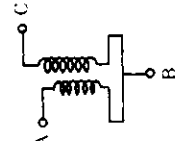
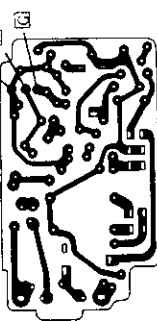
1. Set the mode selector to "M" and turn ON the power switch.
2. Set the measuring instruments as shown Fig.1.
3. Measure the manual level 30 sec. after monitor lamp ON.

In case that manual level is out of standard, adjust it turning VR_{21} shown in Fig.2 with Variable GN/power control set at "1/16".

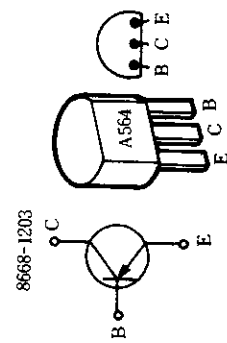
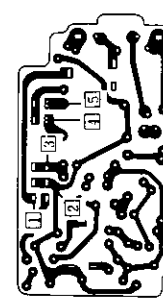
	Variable GN/power control	Standard
Check	1/16	F 8 $\begin{smallmatrix} +0.3\text{EV} \\ -0.4\text{EV} \end{smallmatrix}$
Adjustment	1/8	F 11 $\begin{smallmatrix} +0.7\text{EV} \\ -0\text{EV} \end{smallmatrix}$
	1/4	F 16 $\begin{smallmatrix} +0.7\text{EV} \\ -0\text{EV} \end{smallmatrix}$
	1/2	F 22 $\begin{smallmatrix} +0.7\text{EV} \\ -0\text{EV} \end{smallmatrix}$
	FULL	F 32 $\begin{smallmatrix} +0.7\text{EV} \\ -0\text{EV} \end{smallmatrix}$

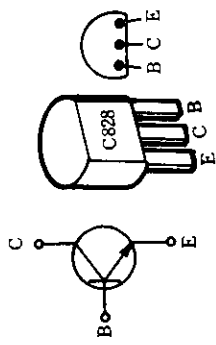
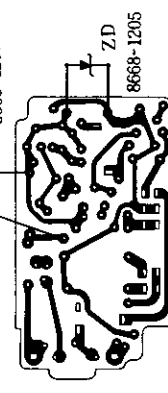
Type	Checking item	Checking method procedure location	Checking portions of elements
J	VR ₁ (8668-1224)	Check VR ₁ referring to I, VR variable resistor checking method.	
	C ₂₂ (8668-1209)	Refer to B'-1 condenser checking method.	
	C ₂₃ (8668-1208)	C ₂₃ , C ₂₃ (open) defective.	
	SW.4 (8668-1202)	Refer to G-3 SW.4 checking method. ...SW.4 contact defective.	
K	Q ₂₅ (8668-1203)	Check Q ₂₅Refer to A'-1 transistor checking method.	
	VR ₂ (8668-1225)	Q ₂₅ (E-C short) defective. Check VR ₂Refer to I, VR checking method.	
	C ₂₄ (8668-1210)	VR ₂ (short) defective. Check C ₂₄Refer to B'-1 condenser checking method.	
	SW.4 (8668-1202)	C ₂₄ (open) defective.	
		Check SW.4Refer to G-3 SW.4 checking method. SW.4 contact defective.	

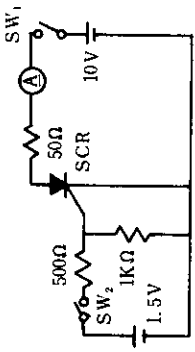
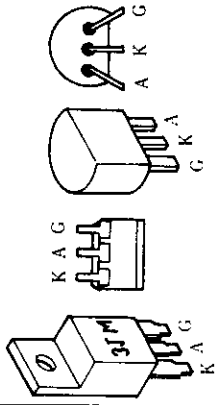
Type	Checking item	Checking method procedure location	Checking portions of elements
I	Q ₂₅ (8668-1203) C ₂₄ (8668-1210) R ₄₇ (8668-1216) VR ₂ (8668-1225) C ₁₈ (8668-1208) R ₄₈ (8668-1217)	<p>Make the connections as shown in Fig. 2 and supply rated power (5.26V, 1.5A).</p> <p>Test</p> <p>With E-C of Q₂₅ shortcircuited, check for light emission (SW.3 ON).</p> <p>Light is emitted in MANUAL (HIGH).</p> <p>Light is Emitted in AUTO.</p> <p>Q₂₅ defective...Refer to A'-1 transistor checking method.</p> <p>{ C₂₄ defective (leak, short) C₁₈ defective (leak, short, open) R₄₇, R₄₈, VR₂ contact defective...Check for conduction B tester. }</p> <p>Refer to H condenser checking method.</p>	<p>VR (variable resistor) checking method.</p> <p>1. When VR is turned with tester connected to terminals A and B, resistance value constantly changes.</p> <p>In that case, VR is acceptable.</p> <p>8668-1224 8668-1225</p> 
J	Q ₂₆ (8668-1303) PhTr (8668-1226)	<p>Remove Q₂₆ from printed base plate check as in A'-1.</p> <p>PhTr defective (E-C short)</p> <p>Discharge main condenser and then apply tester to the patten (shown at right) to which lead wire from photo transistor is connected as follows.</p> <p>Then check for conduction by tester with light applied and interrupted.</p> <p>1. Connection</p> <p>Tester + to black lead ⑥</p> <p>Tester - to red lead ⑦</p> <p>2. Checking method</p> <p>① Tester's indicator deflects when light is applied.</p> <p>② Tester's indicator returns to zero when light is interrupted.</p> <p>If so, the part is acceptable.</p> <p>☆If the part is defective, refer to the precautions manual.</p>	<p>E-C short</p>  <p>8668-0201 Printed base plate B set.</p>

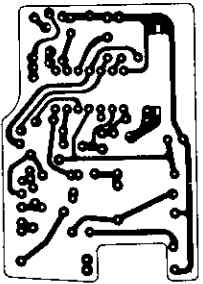
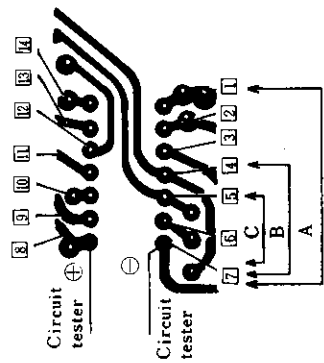
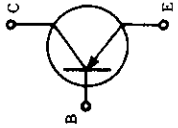
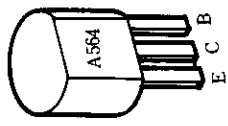
Type	Checking item	Checking method procedure location	Checking portions of elements								
G-3	Trigger transformer T ₂ (8668-1303) T ₃ (8668-1105)	<p>Check for conduction between terminals according to the table. If the requirements are satisfied, the part is acceptable. Ω: ×100 range</p> <table><tr><th>Terminals</th><th>Tester value</th></tr><tr><td>A B</td><td>0 V</td></tr><tr><td>A C</td><td>Several tens ohms.</td></tr><tr><td>B C</td><td></td></tr></table>  	Terminals	Tester value	A B	0 V	A C	Several tens ohms.	B C		Connections for TEST-3 8668-0201 Printed base plate B set. 
Terminals	Tester value										
A B	0 V										
A C	Several tens ohms.										
B C											

H	PhTr (8668-1226) Photo transistor Lead wire (8668-1203) C ₂₂ (8668-1209) C ₂₃ (8668-1208)	<p>Make the connections as shown in Fig. 2 and supply rated voltage (5.26V, 1.5A)</p> <p>Test-1</p> <p>With E-C of PhTr shortcircuited, check for light emission (SW. 3 ON).</p> <p>Light is emitted in MANUAL. HIGH.</p> <p>Test-2</p> <p>With E-C of Q₂₆ shortcircuited, check for light emission (SW. 3 ON).</p> <p>Light is emitted in MANUAL. (HIGH).</p> <p>Light is emitted in AUTO.</p> <p>PhTr defective lead wires 8668-1917, 1918 burnt-out.</p> <p>Light is emitted in AUTO.</p> <p>Q₂₆ defective (Refer to A'-1 transistor checking method).</p> <p>C₂₂, C₂₃ defective...Refer to H condenser checking method. (SW. 4...Refer to G-3 SW. 4 checking method.</p>	<p>Condenser checking method. Remove C₂₂, C₂₃, C₂₄, C₁₈ (leak, short) from printed base plate and check for conduction. If condensers conduct, they are defective. ※Refer to A-5 condenser checking method. ※For connecting point, refer to wiring diagram.</p>
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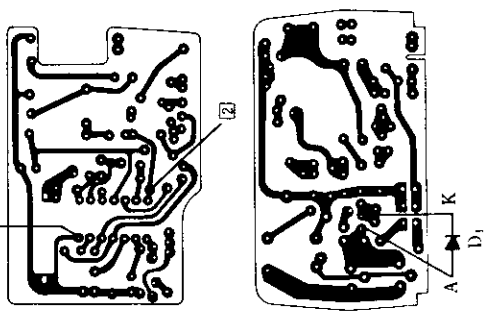
Type	Checking item	Checking method procedure location	Checking portions of elements																																										
G-3	Transistors Q ₂₅ , Q ₂₆ (8668-1203) Mode selector switch SW.4 (8668-1202) Thyristor SCR ₂ (8668-1121) C ₁₉ (8668-1206) C ₂₀ (8668-1212) (R ₅₁ (8668-1223) T ₃ (8668-1105) SCR ₃ (8668-1204) Qu. tube (8668-1107)	<p>Make the connections as shown in Fig.2 and supply rated power (5.26V, 1.5 A).</p> <p>Test- 1</p> <p>With E-C of Q₂₅, Q₂₆ shortcircuited, check for light emission, Set SW.3 to ON)</p> <p>Light is emitted in MANUAL (HIGH)</p> <p>Test- 2</p> <p>With A-K of SCR₃ shortcircuited at a moment, check for light emission in AUTO</p> <p>Light is not emitted in AUTO.</p> <p>Test- 3</p> <p>Check for about 330V between A and K of SCR₃ pattern.</p> <p>It is about 330V.</p> <p>It is not about 330V.</p> <p>R₅₁ contact defective. C₁₉, C₂₁ defective... (Refer to A-5) SCR₃ defective... (Refer to D-2 SCR checking method.)</p> <p>Light is emitted in AUTO.</p> <p>SCR₂ defective (Refer to Type D-2 SCR checking method.)</p> <p>Light is emitted in AUTO.</p> <p>Q₂₅, Q₂₆ defective (refer to Q₂₅, Q₂₆ checking method) SW.4 defective (refer to SW.4 checking method)</p>	<p>Check transistors Q₂₅, Q₂₆ (8668-1203). Remove them from printed base plate and check as in A'-1.</p>  <p>8668-1203</p>  <p>SW.4 (8668-1202) checking method</p> <p>1. Check for conduction of terminals below. If the requirements are satisfied, SW.4 is acceptable. 8668-0201 Printed base plate B set</p> <table border="1"> <thead> <tr> <th>SW. position</th><th>MAN</th><th>MAN</th><th>MAN</th><th>AUTO</th><th>AUTO</th><th>AUTO</th></tr> <tr> <th>Pattern</th><th>Lo.</th><th>Hi.</th><th>F5.6</th><th>F2.8</th><th></th><th></th></tr> </thead> <tbody> <tr> <td>[3] - [1]</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>[3] - [2]</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>[3] - [4]</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>[3] - [5]</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table> <p>Conductive: <input type="checkbox"/> : Indicator deflects. Non-conductive: <input type="checkbox"/> : No deflection.</p>	SW. position	MAN	MAN	MAN	AUTO	AUTO	AUTO	Pattern	Lo.	Hi.	F5.6	F2.8			[3] - [1]							[3] - [2]							[3] - [4]							[3] - [5]						
SW. position	MAN	MAN	MAN	AUTO	AUTO	AUTO																																							
Pattern	Lo.	Hi.	F5.6	F2.8																																									
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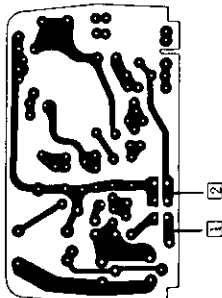
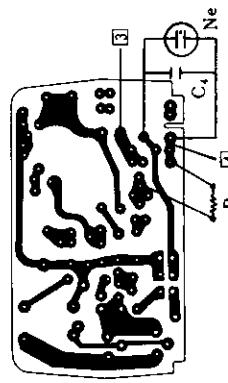
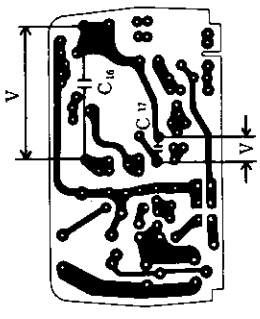
Type	Checking item	Checking method procedure location	Checking portions of elements																																				
D-3	Diodes D ₇ (8668-1305) D ₈ , D ₁₀ (8668-1308)	<p>If D-1, D-2 type parts are normal, D₇, D₈ (short) and D₁₀ (open) may be defective. Removes them from printed base plate and check for conduction. If the requirements in the table are satisfied, diodes D₇, D₈, D₁₀ are acceptable.</p> <p>Table</p> <table><tr><th>Measuring points</th><th colspan="2">How to apply tester, and deflection of indicator.</th></tr><tr><td>A</td><td>+</td><td>No deflection</td></tr><tr><td>K</td><td>—</td><td>No deflection</td></tr><tr><td>A</td><td>+</td><td>Deflects</td></tr><tr><td>K</td><td>—</td><td>Deflects</td></tr></table>	Measuring points	How to apply tester, and deflection of indicator.		A	+	No deflection	K	—	No deflection	A	+	Deflects	K	—	Deflects	<p>Transistors Q₂₇, Q₂₈ (8668-1319) checking method.</p> <ul style="list-style-type: none">Remove them from printed base plate and check for conduction. <p>If the requirements below are satisfied, Q₂₇ and Q₂₈ are acceptable: Ω: $\times 10K$ range</p> <table><tr><th>Measuring points</th><th colspan="2">How to apply tester, and deflection of indicator.</th></tr><tr><td>B</td><td>+</td><td>No deflection</td></tr><tr><td>C</td><td>—</td><td>No deflection</td></tr><tr><td>B</td><td>+</td><td>No deflection</td></tr><tr><td>E</td><td>—</td><td>No deflection</td></tr><tr><td>C</td><td>+</td><td>No deflection</td></tr><tr><td>E</td><td>—</td><td>No deflection</td></tr></table> <p></p>	Measuring points	How to apply tester, and deflection of indicator.		B	+	No deflection	C	—	No deflection	B	+	No deflection	E	—	No deflection	C	+	No deflection	E	—	No deflection
Measuring points	How to apply tester, and deflection of indicator.																																						
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E	—	No deflection																																					
C	+	No deflection																																					
E	—	No deflection																																					
E	Q ₂₇ , Q ₂₈ (8668-1319)	<p>Defective Q₂₇ (due to C-E short) or Q₂₈ (due to C-E open) are possible. Check Q₂₇, Q₂₈ referring to the checking method.</p>																																					
F	Wrong adjustment	<p>Re-adjust AUTO and MANUAL (LOW) light emission level. At that time, if light volume in MANUAL (LOW) is insufficient and turning VR₂ causes no change in light volume, refer to TYPE K.</p>																																					
G-1	Lead wires (8668-1907, 1915)	<p>Check lead wires #1907, #1915 for conduction by tester. Ω: $\times 1$ range</p> <p>For connecting positions, refer to Wiring Diagram.</p>																																					
G-2	Zener diode ZD (8668-1205) C ₂₀ (8668-1207)	<p>Make the connections as shown in Fig. 2 and supply rated power (5.26V, 1.5 A). Then measure voltage (pattern points at right) at both terminals of ZD and of C₂₀. About 0.6V at terminals of ZD About 330V at terminal of C₂₀. If the about is satisfied, ZD and C₂₀ are acceptable.</p>	<p>8668-0201 Printed base plate B set.</p> <p></p>																																				

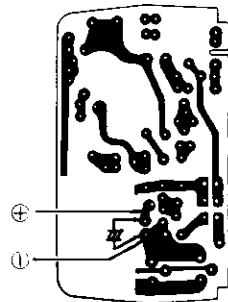
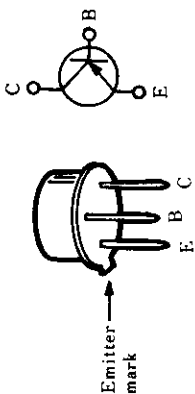
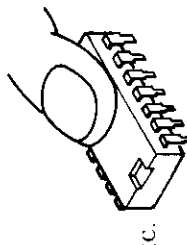
Type	Checking item	Checking method procedure location	Checking portions of elements
D-2	Thyristor SCR ₂ (8668-1121) Condenser C ₁₃ , C ₁₄ , C ₁₅ , C ₁₇ (8668-1310, 1118, 1119, 1113) SCR ₁ (8668-1306) C ₁₂ (8668-1309) C ₁₃ (8668-1310) Xe. tube (8668-1302) T ₂ (8668-1303) C ₁₁ (8668-1313) Q ₂₇ , Q ₂₈ (8668-1319)	<p>Make the connections as shown in Fig. 2 and supply power (5.25V, 1.5A).</p> <p>Test-1</p> <p>With A-K of SCR₂ (8668-1121) shortcircuited, check for light emission.</p> <p>Light is emitted. → SCR₂ defective Check SCR₂. C₁₃, C₁₅, C₁₇ contacts defective C₁₄ defective.</p> <p>Light is not emitted.</p> <p>Test-2</p> <p>Measure voltage between terminals of C₁₂. (For pattern points, refer to parts list.)</p> <p>Voltage is not about 330V. → SCR₁ defective.....Check SCR₁. C₁₂, C₁₃ defective..... Refer to A-5. Voltage is about 330V.</p> <p>Light is emitted</p> <p>Test-3</p> <p>With A-K of SCR₁ (8668-1306) shortcircuited at moment, check for light emission of Xe. tube.</p> <p>Light is not emitted. → Xe. tube defective..... (Visually check trigger band) T₂ defective...Check T₂.</p> <p>Light is emitted.</p> <p>SCR₁ defectivecheck SCR. C₁₁ defective.....Refer to A-5. Q₂₇, Q₂₈ defective.....refer to Q₂₇, Q₂₈ checking method.</p>	<p>SCR checking method.</p> <p>For connecting positions, refer to parts list.</p> <ul style="list-style-type: none"> Remove SCR from printed base plate and make a measuring circuit as follows.  <p>(Criteria)</p> <ol style="list-style-type: none"> 1. Set SW.1 to ON...No indication on ammeter. 2. Set SW.2 to ON...Ammeter indicates. 3. After indication of ammeter, set SW.2 to OFF...Ammeter still indicates. 4. Set SW.1 to OFF...Ammeter stops indicating. <p>If the above requirements are satisfied, SCR are acceptable.</p> 

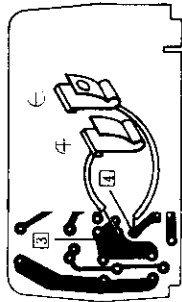
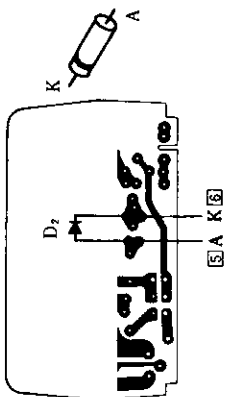
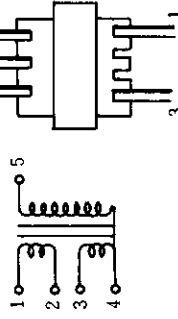
Type	Checking item	Checking method procedure location	Checking portions of elements															
C-3	IC (8668-1304)	<p>Check C-1 and C-2. If these are normal, check IC as follows. Make the connections as shown in Fig.2 and supply power (5.26V, 1.5A). Set the tester to D.C V: $\times 12$ range.</p> <p>1.</p> <table><tr><td>Checking method</td><td>Apply tester \oplus to signal out put pattern point [8] and \ominus to signal out put pattern point [7].</td></tr><tr><td>Camera controlling signal is put out.</td><td>Tester indicates about 3V at approx. 3Hz interval.</td></tr></table> <p>2. IC the about requirements are satisfied, read the voltage when terminals are short-circuited as follows.</p> <table><tr><td>A</td><td>Shortcircuit patterns [1] and [7]</td><td>0 V</td></tr><tr><td>B</td><td>Shortcircuit patterns [4] and [7]</td><td>About 4.5V</td></tr><tr><td>C</td><td>Shortcircuit patterns [5] and [7]</td><td>About 1.4V</td></tr></table> <p>If the above requirements are satisfied, the part is acceptable.</p>	Checking method	Apply tester \oplus to signal out put pattern point [8] and \ominus to signal out put pattern point [7].	Camera controlling signal is put out.	Tester indicates about 3V at approx. 3Hz interval.	A	Shortcircuit patterns [1] and [7]	0 V	B	Shortcircuit patterns [4] and [7]	About 4.5V	C	Shortcircuit patterns [5] and [7]	About 1.4V	<p>8668-0301 Printed base plate C set.</p>  		
Checking method	Apply tester \oplus to signal out put pattern point [8] and \ominus to signal out put pattern point [7].																	
Camera controlling signal is put out.	Tester indicates about 3V at approx. 3Hz interval.																	
A	Shortcircuit patterns [1] and [7]	0 V																
B	Shortcircuit patterns [4] and [7]	About 4.5V																
C	Shortcircuit patterns [5] and [7]	About 1.4V																
C-4	Check parts around IC. Fixed resistors R_{12} , R_{13} (8668-1318) Condensers C_6 , C_7 (8668-1314) Transistor Q_{13} (8668-1307)	<p>If output signal (C-3, Table 1) is not normal after replacement of IC defective contacts of R_{12}, R_{13}, C_6, C_7, Q_{13} or defective Q_{13} are possible. Remove Q_{13} from printed base plate and check it as follows:</p> <p>Table</p> <table><tr><th>Measuring points</th><th>How to apply tester, and deflection of indicator.</th><th></th></tr><tr><td>B</td><td>\oplus</td><td>\ominus No deflection</td></tr><tr><td>C</td><td>\ominus</td><td>\oplus No deflection</td></tr><tr><td>B</td><td>\oplus</td><td>\ominus No deflection</td></tr><tr><td>E</td><td>\ominus</td><td>\oplus No deflection</td></tr></table>	Measuring points	How to apply tester, and deflection of indicator.		B	\oplus	\ominus No deflection	C	\ominus	\oplus No deflection	B	\oplus	\ominus No deflection	E	\ominus	\oplus No deflection	<p>Transistor Q_{13} (8668-1307)</p>  
Measuring points	How to apply tester, and deflection of indicator.																	
B	\oplus	\ominus No deflection																
C	\ominus	\oplus No deflection																
B	\oplus	\ominus No deflection																
E	\ominus	\oplus No deflection																

D-1	<p>Defective lead wires (8668-1902, 1904, 1911, 1913, 1901, 1910, 1905) Xe. tube (8668-1306)</p>	<p>1. Xe. tube, lead wires #1902, #1904, #1911, #1913, Xe. tube trigger. 2. Main condenser, #1901, #1910. 3. Shoe, #1905 *Check for conduction of each lead wire. (Ω: $\times 1$ range) For connecting point, refer to wiring diagram.</p>
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Type	Checking item	Checking method procedure location	Checking portions of elements						
C-1	Lead wire (8668-1912, 1916)	<ul style="list-style-type: none">• Check for conduction between lead wire 8668-1916 terminals (terminal ⑤ (hot shoe set 8668-0605) and printed base plate ③ set 0301), and between lead wire 8668-1912 terminals (terminal ⑥ (hot shoe set and 8668-0605) and Printed base plate ③ set 0301).• If indicator doesn't deflect, burning-out or defective soldering of lead wires 8668-1912, 1916 and defective contacts of hot shoe set 8668-0605 are possible.	Defective lead wire 8668-1916 Defective lead wire 8668-1912 for printed base plate C set connection refer to wiring diagram.						
C-2	Lead wire (8668-1914) (8668-1908) Diode D ₁ (8668-1111)	<p>Make the connections as illustrated in Fig. 2 and supply rated power (5.26V, 1.5A). (Tester D. C V: 12V range)</p> <p>Table</p> <table><tr><th>How to apply tester</th><th>Deflection of indicator</th></tr><tr><td>Tester ⊖ to pattern point ①</td><td>①</td></tr><tr><td>Tester ⊕ to pattern point ②</td><td>About 5 V</td></tr></table> <p>If the tester doesn't indicate 5V, check lead wires 8668-1908, 1914 for burning-out and defective soldering. Or otherwise, check D₁ (8668-1111) as in A-3. Refer to the illustration at right.</p>	How to apply tester	Deflection of indicator	Tester ⊖ to pattern point ①	①	Tester ⊕ to pattern point ②	About 5 V	8668-0301 Printed base plate Cset. 
How to apply tester	Deflection of indicator								
Tester ⊖ to pattern point ①	①								
Tester ⊕ to pattern point ②	About 5 V								
			8668-0101 Printed base plate A set.						

Type	Checking item	Checking method procedure location	Checking portions of elements								
B-1	Switch SW.2 (8668-1108)	Check for conduction between ① and ② in the pattern at right. If the following is satisfied, switch (8668-1108) is acceptable. Table <table><tr><th>Switch position</th><th>Deflection of indicator when tester is applied to ①-②.</th></tr><tr><td>ON</td><td>Indicator deflects.</td></tr><tr><td>OFF</td><td>No deflection.</td></tr></table>	Switch position	Deflection of indicator when tester is applied to ①-②.	ON	Indicator deflects.	OFF	No deflection.	 8668-0101 Printed base plate A		
Switch position	Deflection of indicator when tester is applied to ①-②.										
ON	Indicator deflects.										
OFF	No deflection.										
B-2	Ne. tube (8668-1106) Condenser C ₄ (8668-1115) Fixed resistor R ₃ (8668-1127) Lead wire (8668-1906, 8668-1914)	Make the connections as shown in Fig.2 and supply rated power (5.26V, 1.5A). Then measure voltage between ③ and ④ in the pattern at right. Table <table><tr><th>Reading</th><th>Possible defects</th></tr><tr><td>About 330V</td><td>Defective Ne. tube contact (Voltage is too high.) (If Ne. tube is lighted at main condenser terminal voltage 230 or 250V.)</td></tr><tr><td>Lower than 330V</td><td>Defective Ne. tube, defective C₄</td></tr><tr><td>Almost 0 V</td><td>Leads 8668-1906 } Check for conduction by tester. 8668-1914 } Burnt out or defective contact. Fixed resistor R₃</td></tr></table>	Reading	Possible defects	About 330V	Defective Ne. tube contact (Voltage is too high.) (If Ne. tube is lighted at main condenser terminal voltage 230 or 250V.)	Lower than 330V	Defective Ne. tube, defective C ₄	Almost 0 V	Leads 8668-1906 } Check for conduction by tester. 8668-1914 } Burnt out or defective contact. Fixed resistor R ₃	 Printed base plate A set 8668-0101 For lead wire connecting points, refer to the wiring diagram.
Reading	Possible defects										
About 330V	Defective Ne. tube contact (Voltage is too high.) (If Ne. tube is lighted at main condenser terminal voltage 230 or 250V.)										
Lower than 330V	Defective Ne. tube, defective C ₄										
Almost 0 V	Leads 8668-1906 } Check for conduction by tester. 8668-1914 } Burnt out or defective contact. Fixed resistor R ₃										
B'-1	Condenser C ₁₆ (8668-1119) C ₁₇ (8668-1113)	Make the connections as shown in Fig.2 and supply rated power (5.26V, 1.5A). Then measure voltage at both terminals of C ₁₆ and C ₁₇ by means of a digital tester. If it is not about 330V, remove C ₁₆ and C ₁₇ from the printed base plate. Refer to the description in type A-5.	 8668-0101 Printed base plate A								
B'-2	Main condenser C ₀ (8668-1128)	Make the connections as shown in Fig.2 and supply rated power (5.26V, 1.5A). On completion of charge, measure voltage at both terminals of main condenser by means of a digital tester. If the voltage is not about 330V, replace C ₀ (8668-1128).									

Type	Checking item	Checking method procedure location	Checking portions of elements															
A-5	Condenser C ₂ (8668-1120)	<p>Make the connection as shown in Fig.2 and then supply power (5.26V, 1.5A). Measure voltage at both ends of C₂ (8668-1120). If it is not 330V or so, discharge the condenser and remove it from printed base plate and then check it with tester as follows. (Ω: $\times 10K$ range)</p> <p>Table</p> <table><tr><td>Tester \oplus side to condenser \oplus terminal</td><td>If indicator deflection is great at first but gradually reduced in motion, C₂ is acceptable.</td></tr><tr><td>Tester \ominus side to condenser \ominus terminal</td><td></td></tr></table>	Tester \oplus side to condenser \oplus terminal	If indicator deflection is great at first but gradually reduced in motion, C ₂ is acceptable.	Tester \ominus side to condenser \ominus terminal		 <p>8668-0101 Printed base plate A set.</p>											
Tester \oplus side to condenser \oplus terminal	If indicator deflection is great at first but gradually reduced in motion, C ₂ is acceptable.																	
Tester \ominus side to condenser \ominus terminal																		
A'-1	Transistors Q ₁ , Q ₂ (8668-1104)	<p>Connect the lead wires as illustrated in Fig.2 and supply rated power (5.26V, 1.5A). If Q₁, Q₂ is heated, remove the transistor from the printed base plate and check. If the following requirements are satisfied, transistors Q₁, Q₂ (8668-1104) are acceptable. Table</p> <table><tr><th>Measuring points.</th><th colspan="2">How to apply tester, and deflection of indicator</th></tr><tr><td>B</td><td>+</td><td>-</td></tr><tr><td>C</td><td>-</td><td>+</td></tr><tr><td>B</td><td>+</td><td>-</td></tr><tr><td>E</td><td>-</td><td>+</td></tr></table>	Measuring points.	How to apply tester, and deflection of indicator		B	+	-	C	-	+	B	+	-	E	-	+	<p>Q₁, Q₂ (8668-1104)</p> 
Measuring points.	How to apply tester, and deflection of indicator																	
B	+	-																
C	-	+																
B	+	-																
E	-	+																
A'-2	Condenser C ₃ (8668-1116)	<p>Remove condenser C₃ from the printed base plate and check for conduction. If the indicator of tester deflects (High range of $\Omega \times 10K$), troubles such as leak and shorting exist.</p>	<p>For location of C₃, refer to parts list. Check for leak and shorting.</p>															
A'-3	IC (8668-1304)	<p>Make the wire connections as illustrated in Fig.2 and supply power. Check if IC is heated by touching. If heated, IC is defective.</p>	<p>Check for heating of IC.</p> 															

Type	Checking item	Checking method procedure location	Checking portions of elements											
A-2	Contacts, lead wires (8668-1903, 8668-1909)	<p>Check for conduction as follows. If the following requirements are satisfied, no defect exists.</p> <p>Table</p> <table><tr><th>How to apply tester</th><th>Deflection of indicator</th></tr><tr><td>Between pattern position ③ and battery contact ⊕.</td><td rowspan="2">Indicator deflects.</td></tr><tr><td>Between pattern position ④ and battery contact ⊖.</td></tr></table>	How to apply tester	Deflection of indicator	Between pattern position ③ and battery contact ⊕.	Indicator deflects.	Between pattern position ④ and battery contact ⊖.	8668-0101 Printed base plate A set. Ω: range 						
How to apply tester	Deflection of indicator													
Between pattern position ③ and battery contact ⊕.	Indicator deflects.													
Between pattern position ④ and battery contact ⊖.														
A-3	Diode D ₂ (8668-1110)	<p>Check for conduction of D₂ (8668-1110). If the following, is satisfied, it is acceptable.</p> <p>Table</p> <table><tr><th rowspan="2">Measuring points (Pattern positions)</th><th colspan="2">How to apply tester, and deflection of indicator</th></tr><tr><th>+</th><th>No Deflection</th></tr><tr><td>⑤ (A)</td><td>+</td><td>-</td></tr><tr><td>⑥ (K)</td><td>-</td><td>+</td></tr></table>	Measuring points (Pattern positions)	How to apply tester, and deflection of indicator		+	No Deflection	⑤ (A)	+	-	⑥ (K)	-	+	8668-0101 Printed base plate A set. Ω: range 
Measuring points (Pattern positions)	How to apply tester, and deflection of indicator													
	+	No Deflection												
⑤ (A)	+	-												
⑥ (K)	-	+												
A-4	Oscillating transformer T ₁ (8665-1104)	<p>Remove transformer T₁ (8668-1104) from printed base plate and check for conduction, the transformer is acceptable.</p> <p>Table</p> <table><tr><th>Transformer terminals.</th><th>Tester's indicator</th></tr><tr><td>1 - 2</td><td>Deflects (0 Ω)</td></tr><tr><td>3 - 4</td><td>Deflects (0 Ω)</td></tr><tr><td>3 - 5</td><td>Slightly deflects</td></tr></table>	Transformer terminals.	Tester's indicator	1 - 2	Deflects (0 Ω)	3 - 4	Deflects (0 Ω)	3 - 5	Slightly deflects	Ω: range 2 5 4 			
Transformer terminals.	Tester's indicator													
1 - 2	Deflects (0 Ω)													
3 - 4	Deflects (0 Ω)													
3 - 5	Slightly deflects													

8668 INSPECTION TABLE

Carry out inspection of each part according to the following method with reference to the Trouble Shooting Chart.

- (Note) 1. When checking operations with use of constant than those specified.
 2. If power supply by power supply adapter is difficult, supply power by connecting power sourcelead wire directly to the battery contact (rated 5.26V, 1.5A constant.)

Fig. 1

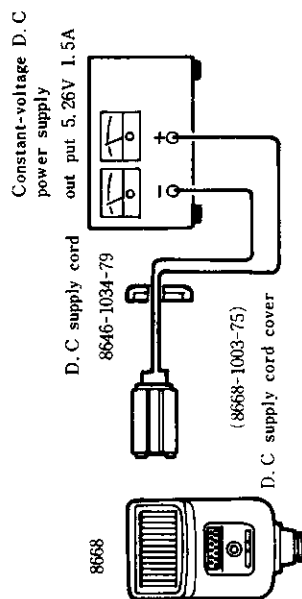
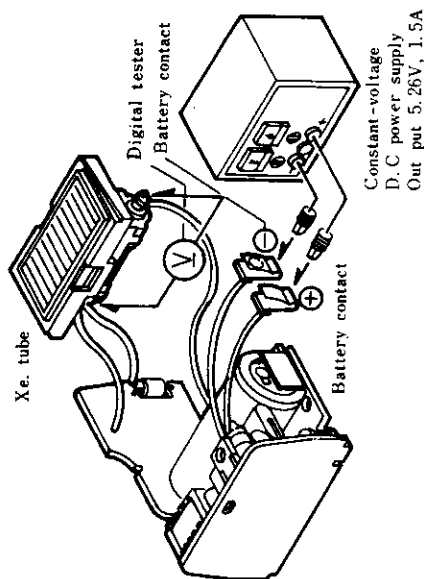
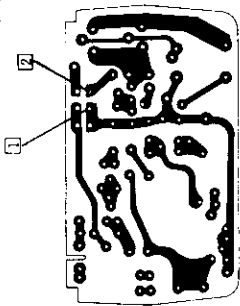


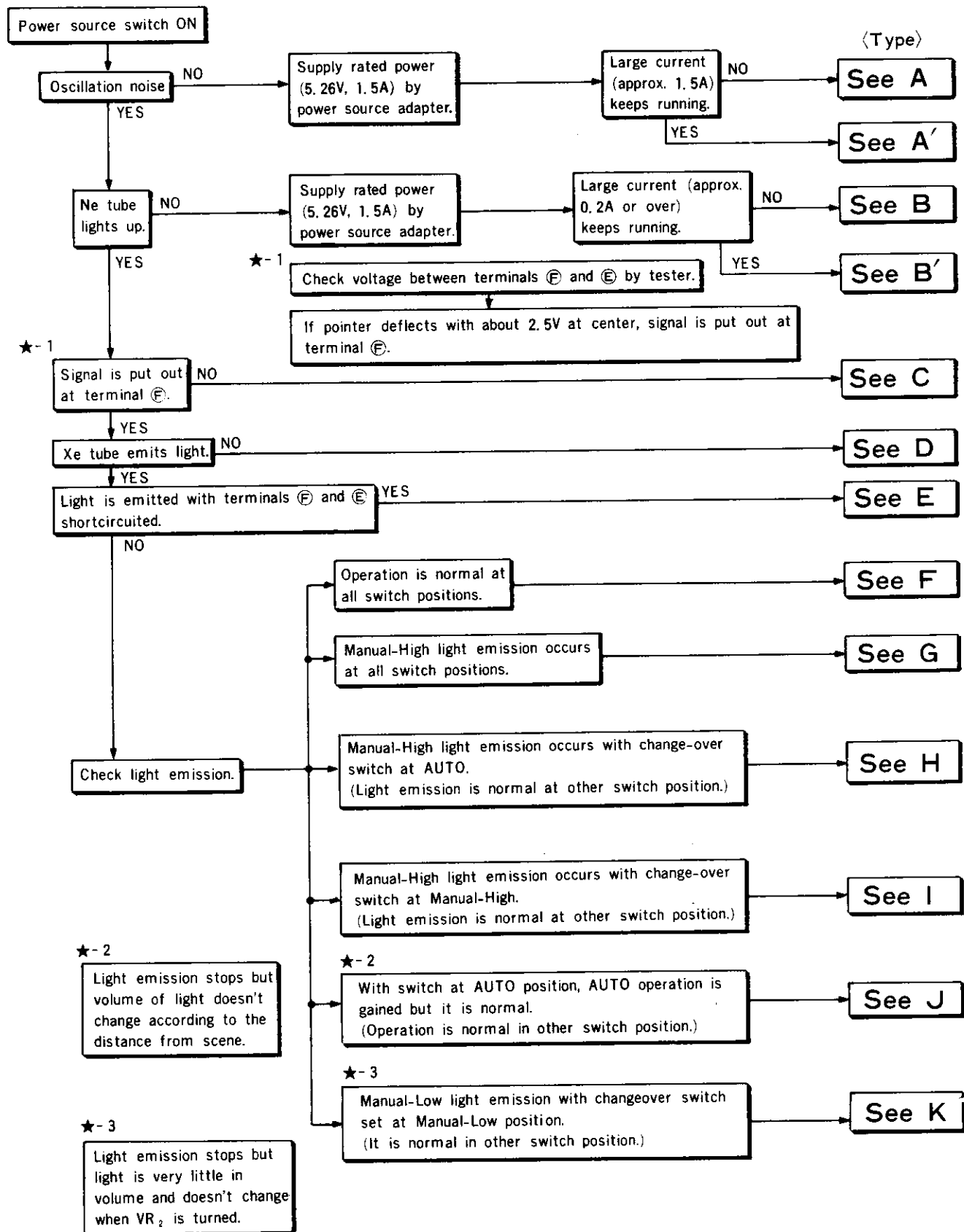
Fig. 2



Type	Checking item	Checking method procedure location	Checking portions of elements						
A-1	Power supply switch (8668-1108)	<p>Check for conduction of switch (8668-1108) with out pattern power supply. Apply tester to ①, ② of the pattern at right. If the following requirements are satisfied, it is acceptable.</p> <p>Table</p> <table><tr><th>Switch position</th><th>Apply tester to ① - ②</th></tr><tr><td>ON</td><td>Indicator deflects (short).</td></tr><tr><td>OFF</td><td>Indicator doesn't deflect (open).</td></tr></table>	Switch position	Apply tester to ① - ②	ON	Indicator deflects (short).	OFF	Indicator doesn't deflect (open).	<p>Checking for defective contact</p> <p>Ω: range</p> 
Switch position	Apply tester to ① - ②								
ON	Indicator deflects (short).								
OFF	Indicator doesn't deflect (open).								

8668-0101 Printed base plate A set.

8668 Trouble Shooting Chart



- ④調整後はストロボテスターの指針が下記の許容範囲に入っているか確認する。

表-2

Ne. 管点灯直後	$F 4 - \frac{2}{3} \sim F 4 + \frac{1}{3} EV$
Full 充電時	$F 4 - \frac{1}{3} \sim F 5.6 EV$

3. 確認事項

- ①オートワインダー使用時における連続シンクロ発光確認

- ・オートワインダー付カメラにこのストロボをセットし切替スイッチをマニュアルLowに切替わっているか確認し、メインスイッチ(ストロボ)をONし、ネオン管が点灯した事を確認する。この時、カメラ側ファインダーをのぞいて、ストロボ同調OKのシグナルが出ているか確認後シャッターボタンを押して確実に発光している事を確認する。

発光が不良であれば電源を調べた後に調整編2 マニュアルLow発光レベル調整をやり直す事。

注 意

このとき電源バッテリーは#8656ニッカドバッテリーチャージャーにてニッカド電池を8時間フル充電したものをを使う。

- ④After adjustment check strobo tester standard value.

Table-2

F No. $F 4 - \frac{2}{3} \sim F 4 + \frac{1}{3} EV$	When the lighting Ne tube
F No. $F 4 - \frac{1}{3} \sim F 5.6 EV$	Main condenser full

3. Conviction a matter

- ①When used auto-winder, we have conviction of continuation strobo lightting photograph..

- Seetting of the strobo lange manual-Low. And main switch-on, after lightting neon lamp.

Checking sync. signal of strobo.

The next plays on shutter button, that conviction lightting strobo, if bad adjusting light, Manual Low revel adjust again.

Caution

When conviction strobo lighting photograph, please used Ni-cd batteries that was eight hours full charging.

- ④調整後はストロボテスターの指針が下記の許容範囲に入っているか確認する。表-1

表-1

被測定ストロボの絞り切替ダイヤル設定

F2.8

F5.6

ストロボテスターの指針許容範囲

F2.8……F2.8+0.7EV~F2.8-0.5EV

F5.6……F5.6±0.5EV

(注)

1. 測定中はストロボテスターの測光釦を押し続ける。
2. 定電圧直流電源の出力を5.26V, 1.5A以上に設定しない事(メインコンデンサー端子電圧を350V以上にして何度も発光させると不良になる恐れがある為)

2. マニュアルLow発光レベル調整

(手順)

- ①オートレベルの調整Fig. 5同様器材を接続する。
(ただし測定距離1.4m)
- ②各器材のダイヤル及びスイッチを設定する。
 - 定電圧直流電源の設定
出力5.26V, 0.5A
 - デジタルテスターの設定
レンジD.C, V
 - ストロボテスターの設定ST-I, 又はST-II
ASAダイヤル 80
測光ダイヤル 1/30
反射光受光部装着
 - ストロボテスター ST-IIの場合 CNO.=20
 - 被測定ストロボの設定
絞り切替MANUAL (LOW)
- ③ネオン管が点灯した直後にストロボテスターの測光釦を押す。その時のストロボテスターの指針が規格値内になる様に半固定抵抗器を回す(Fig. 6参照)
規格(F4-0.66~F4EV)

- ④After the adjustment, be sure to confirm that the strobometer indicates as shown in Table-1.

Table-1.

Exposure dial of strobo

F 2.8

F 5.6

Indicator needle of Strobo tester

F 2.8……F 2.8+0.7EV~F 2.8-0.5EV

F 5.6……F 5.6±0.5EV

(Caution)

1. Be sure to keep pressing the measuring button of the strobo tester during the measuring operation.
2. When the main condenser terminal voltage condition to D.C 350V more, then many times flashing light is defective the main condenser.
How ever must not do institute of the constant-voltage D.C power supply for 5.26V, 1.5A more.

2. Adjustment of Manual Low lighting level.

(How to adjust)

- ①Install the strobo tester and the auto electro flash to be adjusted, opposite to the reflection paper, and connect the instruments as shown in Fig.5. (But measurement distance=1.4m)
- ②Setting dial position
 - Constant voltage D.C power supply
(Out put……5.26V, 0.5A)
 - Digital tester
(Range……D.C V)
 - Strobo tester Model ST-I
(ASA dial……80)
(Measuring time selector……1/30)
(Setting of the reflected light receptor-view finder.)
 - Strobo tester Model ST-II (Scale……20)
 - Setting of the strobo to be measured.
(Switching……Manual-Low)
- ③It be sure the digi-vol indicator voltage, lighting the neon tube after that, them more at 30sec., next press the measuring button of strobo tester.
Turn the variable resistor so that the strobo tester may indicate standard value. (See Fig.6 Standard value (F4-0.66~F4EV))

1. オートレベル調整

(手順)

- ① ストロボテスターと被測定ストロボを反射紙に正対させ Fig. 5 の様に各器材を接続する。
- ② 各器材のダイヤル及びスイッチを設定する。
 - ・ 定電圧直流電源の設定……出力 5.26V, 1.5A
 - ・ デジタルテスターの設定……レンジ D.C, V
 - ・ ストロボテスター ST-I の設定
 - …… ASA ダイヤル……80
 - 測光ダイヤル……1/30
 - 反射光受光部装着
 - ・ ストロボテスター ST-II の設定……補正目盛 20
 - ・ 被測定ストロボの設定……絞り切替えスイッチ F 5.6, AUTO, ASA 100
- ③ デジタルテスターの表示が 5.26V になっている事を確認し、ネオン管点灯後 30 秒以上経過すればストロボテスターの測光釦を押す。その時のストロボテスターの指針が規格値内になる様に半固定抵抗器を回す。Fig. 5 参照 (規格値 $F 5.6 \pm 0.3EV$)

1. Adjustment of auto level

(How to adjust)

- ① Install the strobo tester and the auto electroflash to be adjusted, opposite to the reflection paper, and connect the instruments as shown in Fig. 5.
- ② Setting dial and switch.
 - ・ Constant voltage D.C power supply…… (output 5.26V 1.5A)
 - ・ Digital tester…… (Range D.C V)
 - ・ Strobo tester Model ST-I
 - (ASA dial……80)
 - (Measuring time selector……1/30)
 - (Setting of the reflected light receptor-view finder.)
 - ・ Setting of the strobo tester Model ST-II (scale……20)
 - ・ Setting of the strobo to be measured (F 5.6, ASA 100, AUTO)
- ③ It be sure the digital tester indicator 5.26V voltage, lighting the neon tube after that, then more at 30sec., next press the measuring button of strobo tester. Turn the variable resistor (# 1224) so that the strobo tester may indicate $F 5.6 \pm 0.3EV$.

Fig. 5

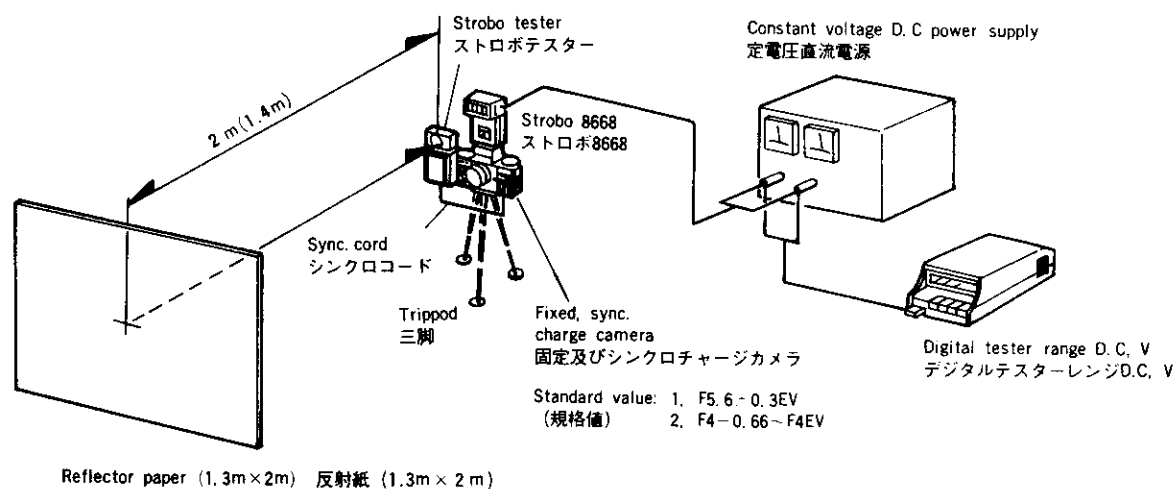
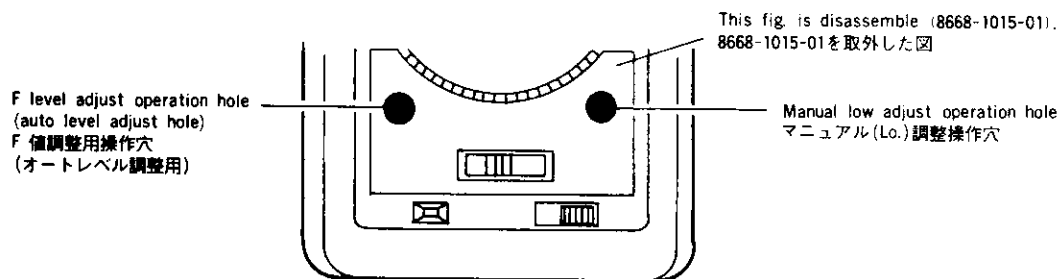


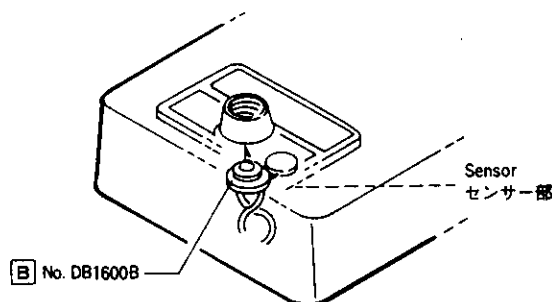
Fig. 6



3. センサー部取付けの注意

- センサー部を取付ける場合光が入るとオートの動作に支障をきたすので接着剤はダイヤモンド社No. DB 1600B（共立化学仕入れ）によって確実に遮光接着する事。

Fig. 4



3. Caution of the sensor

- When the sensor setting it used bond Diamond Co., LTD., No. DB 1600B.

C. 点検時の注意事項

1. 発光部確認の注意

- 発光部を発光させて確認する際SCRのA-K間ショートによるXe管発光確認はしない事（8646一点検一覧表参照）

C. Caution of the sensor

1. Caution of the reflector check

- When the lighting reflector, you should never short of the SCR A & K (See page 8646 check list)

D. 調整及び確認方法

〈調 整〉

(準備器材)

1. ストロボテスター Model ST-I or ST-II
2. 定電圧直流電源
3. デジタルテスター又は直流電圧計
4. 反射紙 1.3m × 2 m (スーベリア社製シームレスペーパー #23 {25%})
5. 電源アダプター (8646-1034-79)
6. 電源アダプター蓋 (8668-1003-75)
7. 輝度校正用ドライバー
8. 三脚
9. ストロボ固定用カメラ (ホットシュー "X" 及びシンクロターミナル付カメラ)

(条 件)

1. 測定する室内の明るさ（反射紙前面）
約50 lx以下、出来るだけ暗くする。
2. ストロボテスター Model ST-I を使用する際は付属品用目盛約1以下の事。

D. Adjustment and Checking

〈ADJUSTMENT〉

(Required)

1. Minolta strobo tester Model ST-I or ST-II.
2. Constant-voltage D.C power supply.
3. Digital tester Type 2507 or D.C voltage meter.
4. Reflection paper 1.3m × 2 m (Superior seamless paper #23).
5. D.C supply cord (8646-1034-79).
6. Battery case cap (8668-1003-75).
7. Luminescence adjustment screw driver (Insulated driver).
8. Tripod.
9. Camera for fixing the auto electroflash 200X. (Hot shoe and sync. terminal).

(Conditions)

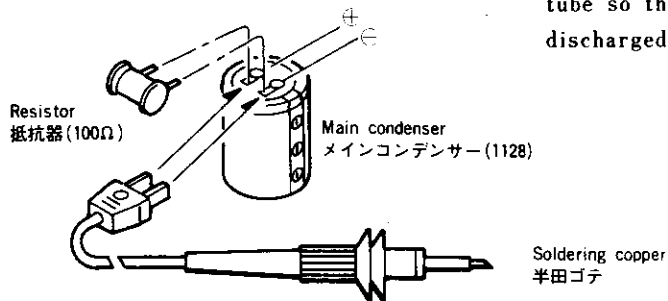
1. Brightness of the room for measuring. (the front of the reflection paper)
.....Approx. 50 lx or less (the darker is the better).
2. When measuring with Strobo tester Model ST-I, the reference number for accessories must be about 1 or less.

A. 分解時の注意

1. メインコンデンサー放電

- 分解時メインコンデンサー残留エネルギーによる電撃防止の為、抵抗 100Ω か又は半田ゴテでメインコンデンサーの端子を短絡させて残留エネルギーを放電させて分解して下さい。(Fig. 1 参照)

Fig. 1



A. Caution of disassembly

1. Discharge from the main condenser

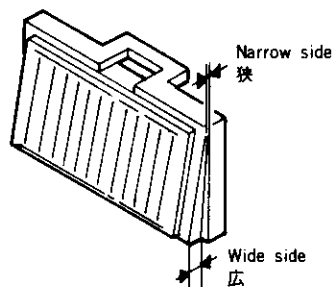
- When removing the main condenser, it is necessary to prevent its residual energy from causing an electric shock to this end, make a shortcircuit between its both terminals or between both ends of the Xe. tube so that its residual energy may be discharged. (See Fig. 1)

B. 組立時の注意

1. パネルの方向性に注意

- パネルを取り付ける時はFig. 2のように幅の広がつている方を下にしてはめこむ事。

Fig. 2



B. Caution of assembly

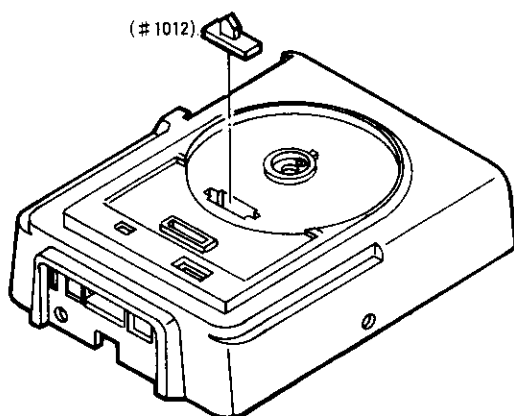
1. Use caution with the direction of the panel.

- When setting panel as Fig. 2 as set position.

2. 露出ダイヤル組立時の注意

- 露出ダイヤル組立時はクリックストッパー #1012 を入れ忘れない事。入れ忘れると露出ダイヤルを取り外すのに困るので確実に入れる事。もし入れ忘れた時は粘着テープを張って強く引っ張って取る。

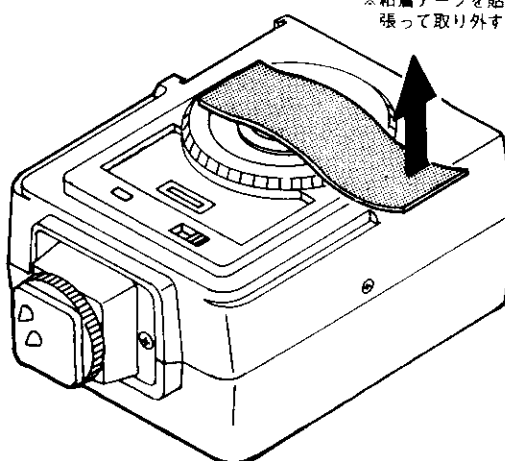
Fig. 3



2. Caution at assembly of exposure dial

- Caution of the exposure-dial you must set click stopper, when you forget click stopper, how to disassembly used tape.

※ Strongly pull out a large piece of the tape attached on it.
※ 粘着テープを貼って強く引っ張って取り外す



CAUTION AND ADJUSTMENT

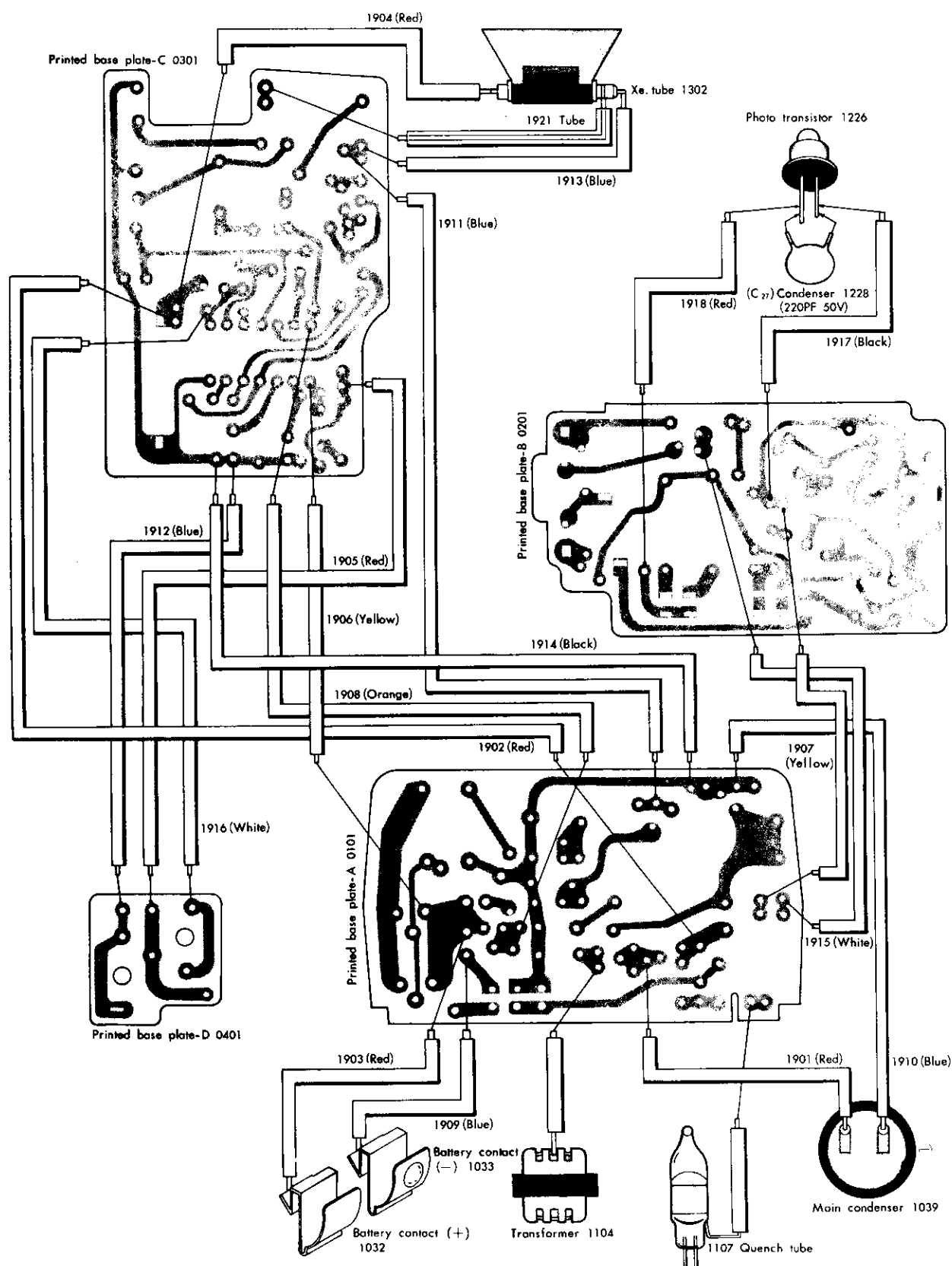
	Page
A. Cautions at disassembly	
1. Discharge of the main condenser	1
B. Caution at assembly	
1. How to set panel	1
2. Caution at assembly of exposure dial	1
2. How to set sensor	2
C. Caution at when test of light.	
1. Caution at light	2
D. Adjustment and test	
1. How to adjustment auto level	3 ~ 4
2. How to adjustment manual low level	4 ~ 5
3. Other check the head	5

注意事項と調整方法

	頁
A. 分解時の注意事項	
1. メインコンデンサー放電	1
B. 組立時の注意事項	
1. パネルの方向性	1
2. 露出ダイヤル組立時の注意	1
3. センサーの取付け	2
C. 点検時の注意事項	
1. 発光部点検の注意事項	2
D. 調整及び確認事項	
1. オートレベルの調整	3 ~ 4
2. マニュアル (Low) 発光レベル調整	4 ~ 5
3. その他確認事項	5

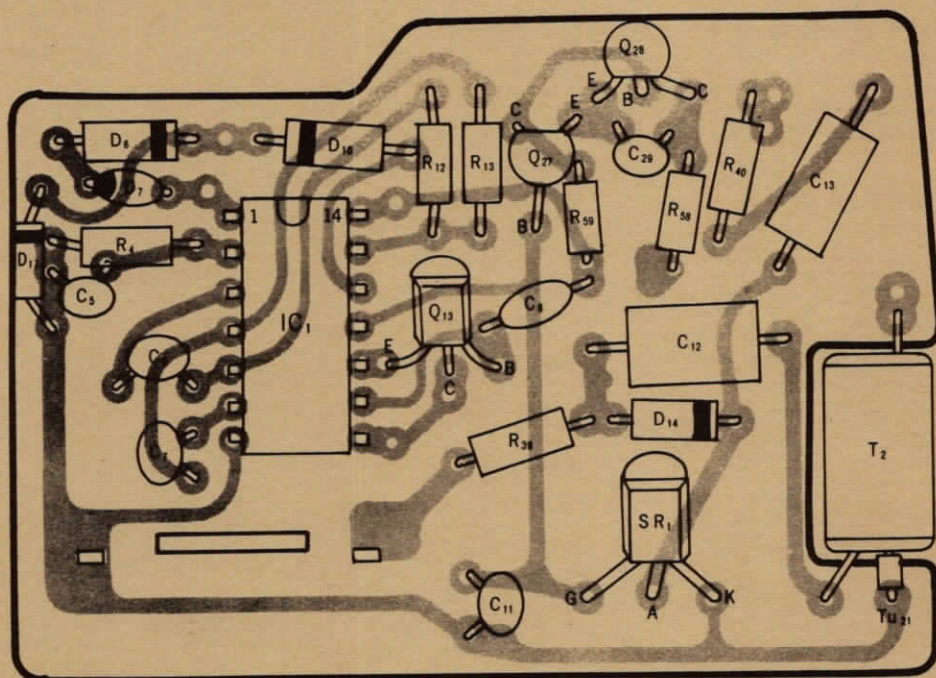
8668 Wiring Schematic Diagram

8668 実体配線図



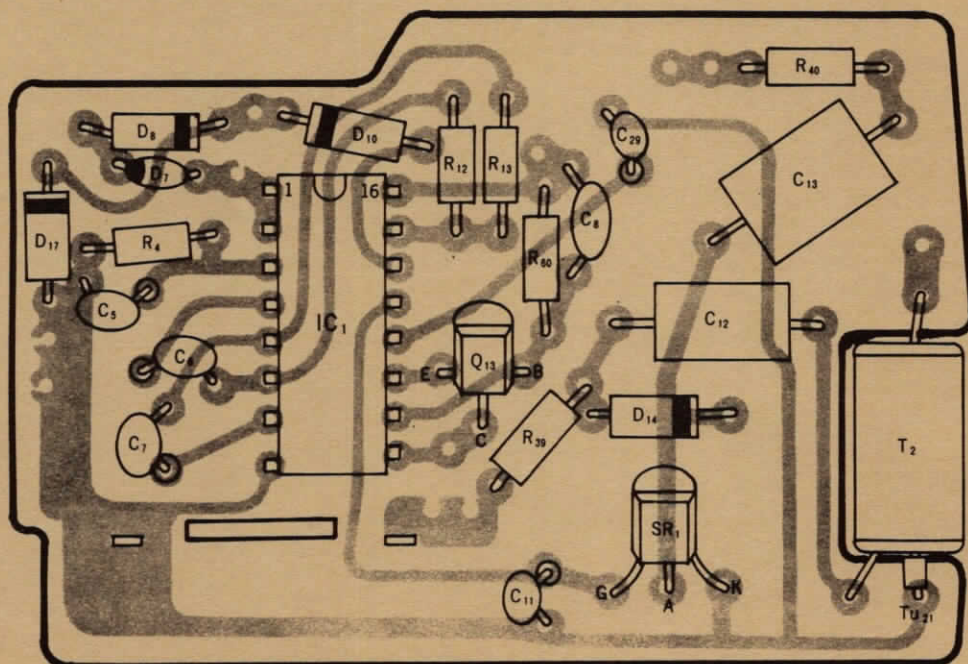
Circuit No. 回路記号	Part No. 部品番号	Part Name 部品名称	Qty 員数
	8668-0201-01	Printed base plate-B set プリント基板Bセット	1
C ₂₁	8668-1115-01	Condenser (100 pF, 500V) セラミックコンデンサー	1
C ₂₈ , C ₂₅	8668-1118-01	Semi conductor condenser (0.05 μ F, 12V) 半導体コンデンサー	2
R ₄₅ , R ₄₆	8668-1126-01	Fixed resistor (1K Ω , $\frac{1}{4}$ W) 固定抵抗器	2
R ₅₁	8668-1127-01	Fixed resistor (1M Ω , $\frac{1}{4}$ W) 固定抵抗器	1
SW ₄	8668-1202-01	Switch (STB-24-055) スイッチ	1
Q ₂₅ , Q ₂₆	8668-1203-01	Transistor QR (2SA-564) トランジスター	2
SCR ₃	8668-1204-01	Thyristor (M2IC) サイリスター	1
ZD	8668-1205-01	Zenor diode (MZ-209) ツェナーダイオード	1
C ₁₉	8668-1206-01	Condenser (0.047 μ F, 150V) MDコンデンサー	1
C ₂₀	8668-1207-01	Condenser (0.1 μ F, 100, 150V) MDコンデンサー	1
C ₁₈ , C ₂₃	8668-1208-01	Condenser (0.15 μ F, 100V) MDコンデンサー	2
C ₂₂	8668-1209-01	Condenser (0.039 μ F, 150V) MDコンデンサー	1
C ₂₄	8668-1210-01	Semi conductor condenser (0.047 μ F, 12V) 半導体コンデンサー	1
D ₁₆	8668-1213-01	Varistor (KB-169) バリスター	1
R ₅₀	8668-1214-01	Fixed resistor (1.2M Ω , $\frac{1}{4}$ W) 固定抵抗器	1
R ₅₂	8668-1215-01	Fixed resistor (820K Ω , $\frac{1}{4}$ W) 固定抵抗器	1
R ₄₇	8668-1216-01	Fixed resistor (820 Ω , $\frac{1}{4}$ W) 固定抵抗器	1
R ₄₈	8668-1217-01	Fixed resistor (560 Ω , $\frac{1}{4}$ W) 固定抵抗器	1
R ₄₉	8668-1218-01	Fixed resistor (2.2M Ω , $\frac{1}{4}$ W) 固定抵抗器	1
R ₅₆	8668-1219-01	Fixed resistor (1.2K Ω , $\frac{1}{8}$ W) 固定抵抗器	1
R ₅₅	8668-1220-01	Fixed resistor (4.7K Ω , $\frac{1}{8}$ W) 固定抵抗器	1
R ₅₃ , R ₅₄ , R ₅₇	8668-1221-01	Fixed resistor (10K Ω , $\frac{1}{8}$ W) 固定抵抗器	3
VR ₁	8668-1224-01	Variable resistor (3K Ω) 半固定抵抗器	1
VR ₂	8668-1225-01	Variable resistor (50K Ω) 半固定抵抗器	1
⑫	8668-1907-01	Lead wire (Yellow) リード線(黄)(ℓ -60mm, UL, 1007 #26)	1
⑬	8668-1915-01	Lead wire (White) リード線(白)(ℓ -80mm, UL, 1007 #26)	1
⑭	8668-1917-01	Lead wire (Black) リード線(黒)(ℓ -120mm, 0.12/7 wire)	1
⑮	8668-1918-01	Lead wire (Red) リード線(赤)(ℓ -130mm, 0.12/7 wires)	1
	8668-1923-01	Tube (ℓ -4mm, 1 ϕ) イラックスチューブ	2

8668-0301-01 [I]



Replaceable in a set with
slightly changing of wiring
配線を少しかえればセットで
互換性があります

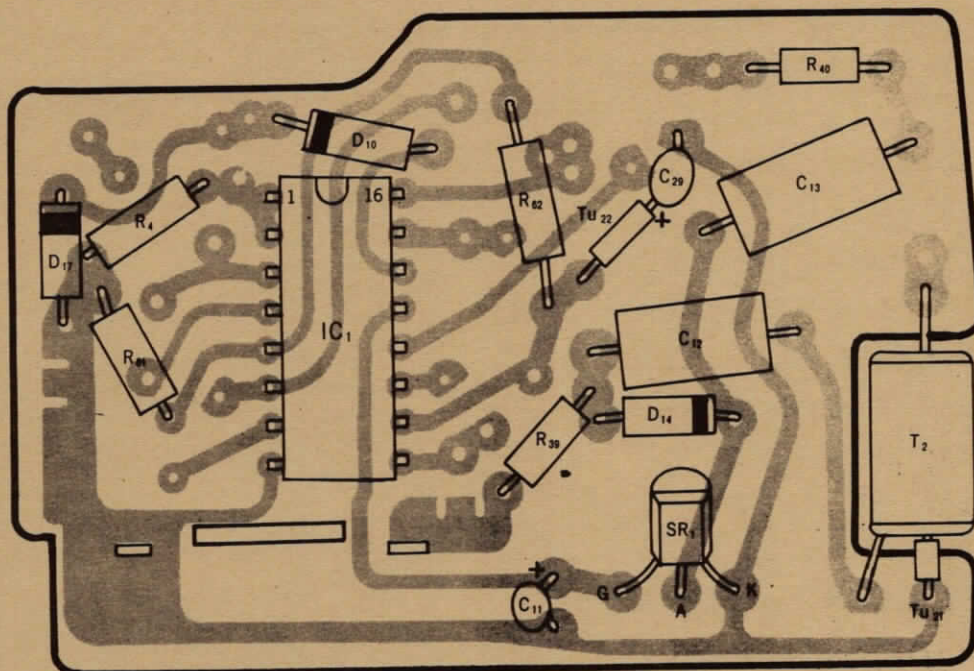
8668-0301-01 [II]



AUTO ELECTRO FLASH 200X

CODE No. 8668

8668-0301-01 [Ⅲ]



Replaceable
互換性あり

Pay attention with type of printed base plate because one type of three types (I、II、III) will be delivered

[Ⅰ][Ⅱ][Ⅲ]型のいずれかが送られますのでどのタイプの物であるか注意して下さい。

Assy Part No. 8668-0201-01

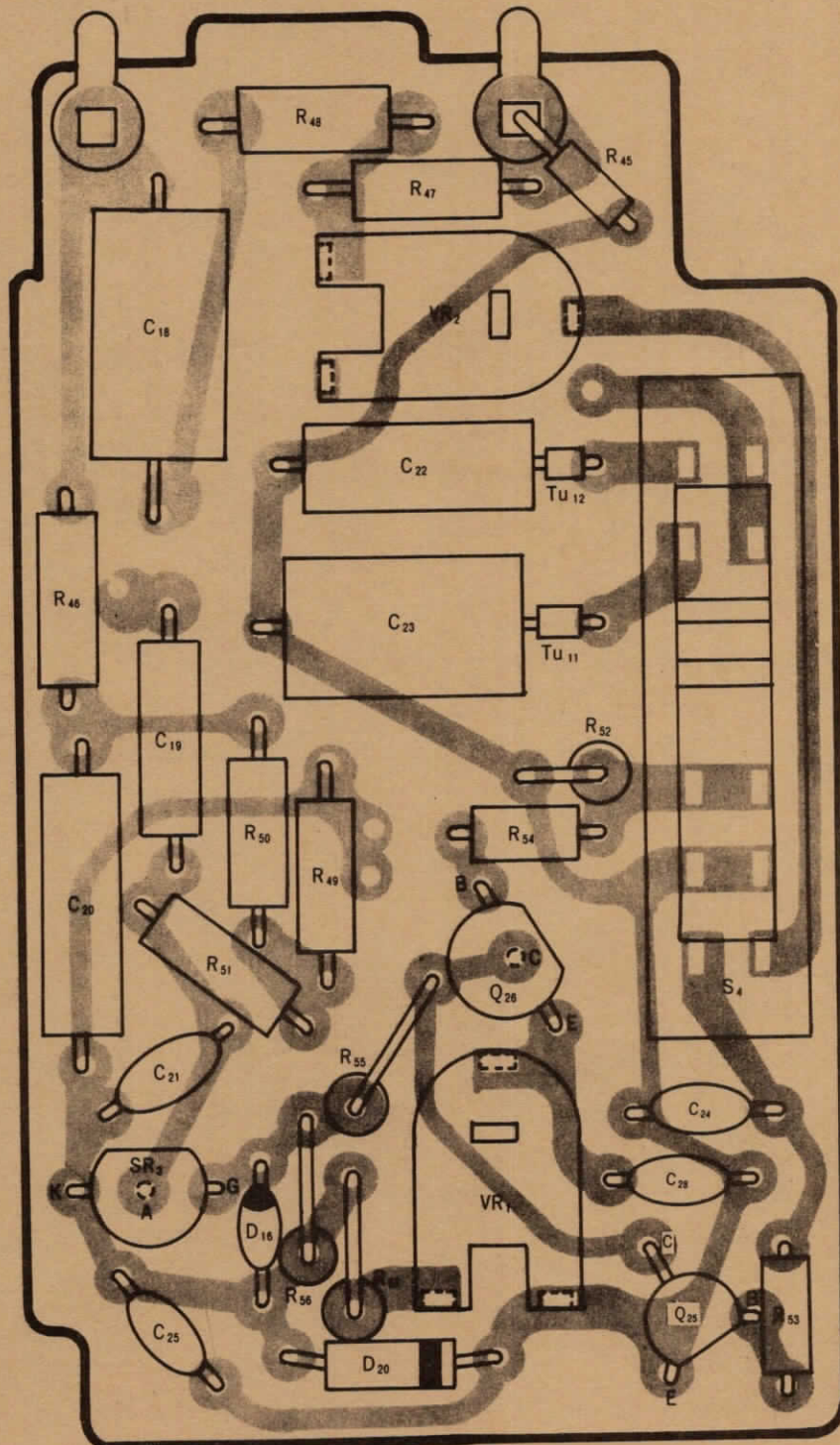
Assy Part Name Printed base plate-B set

プリント基板Bセット

Symbol	Part No.	Part Name	Type	Qty.
D16	8668-1213-01	Varistor	KB-169	1
D20	8668-1205-01	Diode	MZ-209	1
	9361-4081-01		MZ-309	
	9361-4082-01		RD9.1E	
Q25 Q26	8668-1203-01	Transistor	2SA564	2
	8668-1203-01		2SA115	
SR3	8668-1204-01	SCR	M-21C	1
R45 R46	8668-1126-01	Fixed resistor	1K Ω 1/4W	2
R47	8668-1216-01		820 Ω 1/4W	1
R48	8668-1217-01		560 Ω 1/4W	1
R49	8668-1218-01		2.2M Ω 1/4W	1
R50	8668-1214-01		1.2M Ω 1/4W	1
R51	8668-1127-01		1M Ω 1/4W	1
R52	8668-1215-01		820K Ω 1/4W	1
R53 R54 R57	8668-1221-01		10K Ω 1/8W	3
R55	8668-1220-01		4.7K Ω 1/8W	1
R56	8668-1219-01		1.2K Ω 1/8W	1
C18 C23	8668-1208-01	Condenser	0.15 μ F/100V	2
C19	8668-1206-01		0.047 μ F/150V	1
C20	8668-1207-01		0.1 μ F/150V	1
C21	8668-1115-01		100PF/500V	1
C22	8668-1209-01		0.039 μ F/150V	1
C24	8668-1210-01		0.047 μ F/12V	1
C25 C28	8668-1118-01		0.05 μ F/12V	2
VR1	8668-1224-01	Variable resistor (3K Ω) (50K Ω)	EVNK4AA00B33	1
VR2	8668-1225-03		EVN-K44A00B54	1
S4	8668-1202-01	Switch	STB-24-055	1
Tu11 Tu12	8668-1923-01	Tube	ϕ 1 l =4mm	2

AUTO ELECTRO FLASH 200X**CODE No. 8668**

8668-0201-01



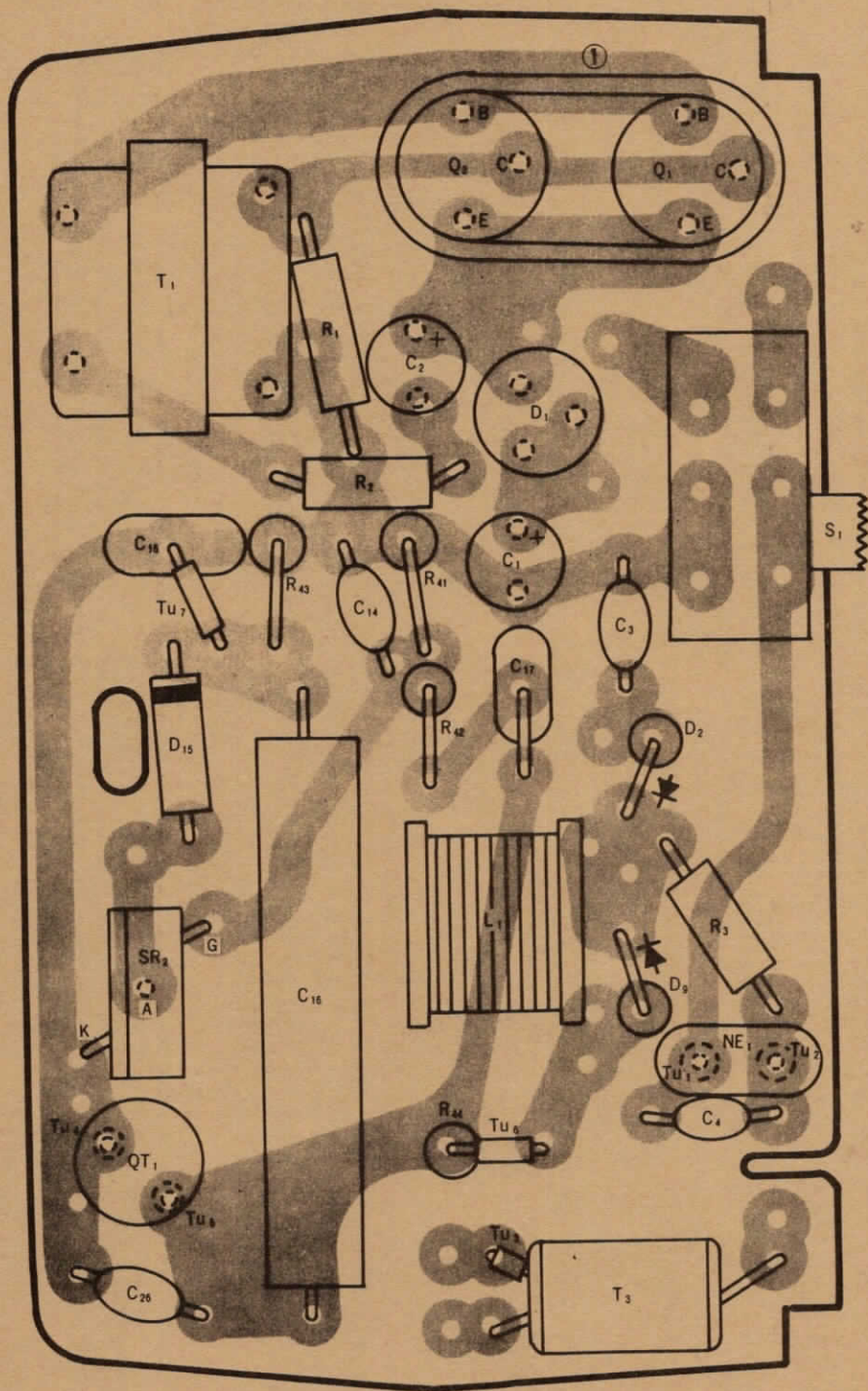
Assy Part No. 8668-0101-01

Assy Part Name Printed base plate A set
プリント基板Aセット

Symbol	Part No.	Part Name	Type	Qty.
D1	8668-1111-01	Diode	MA23B	} 1
			2SB-175	
D2	8668-1110-01		S1R-150	1
D9, D15	8668-1109-01		10D-8	} 2
	8804-1203-01		SRIFM-12K	
Q1,Q2	8668-1104-01	Transistor	2SB651W	2
SR2	8668-1121-01	S C R	CR3JM-8	1
R1	8668-1124-01	Fixed resistor	3.3K Ω 1/4W	1
R2	8668-1123-01		3.9K Ω 1/4W	1
R3	8668-1127-01		1M Ω 1/4W	1
R41	8668-1125-01		22 Ω 1/4W	1
R42	8668-1126-01		1K Ω 1/4W	1
R43,R44	8668-1122-01		15K Ω 1W	2
C1	8668-1112-01	Condenser	100 μ F/6.3V	1
C2	8668-1120-01		10 μ F/16V	1
C3	8668-1116-01		300PF/500V	} 1
	8668-1116-11		330PF/500V	
C4	8668-1115-01		100PF/500V	1
C14	8668-1118-01		0.05 μ F/12V	1
C15	8668-1114-01		0.068 μ F/150V	1
C16	8668-1119-01		3.3 μ F/100V	1
C17	8668-1113-01		0.047 μ F/150V	1
C26	8668-1117-01		500PF/500V	} 1
	8668-1117-11		470PF/500V	
T1	8665-1104-01	Transformer	#8665	1
T3	8668-1105-01	Trigger coil	NC-350	1
L1	8668-1103-01	Inductor	272L1	1
NE1	8668-1106-01	Neon tube	NE-240D	1
QT	8668-1107-01	Quench tube	W07-2B	1
S1	8668-1108-01	Switch	SS-207-A1	1
Tu1,Tu2	8668-1920-01	Tube	$\phi 1 \ell = 5\text{mm}$	2
Tu3	8668-1922-01		$\phi 1 \ell = 3\text{mm}$	1
Tu4,Tu5	8668-1924-01		UL イラックス チューブ	2
Tu6	9384-2905-01		$\phi 1 \ell = 15\text{mm}$	1
Tu7	8668-1925-01		$\phi 0.7 \ell = 13\text{mm}$	1
①	8668-1129-01	Radiator		1

AUTO ELECTRO FLASH 200X**CODE No. 8668**

8668-0101-01



SERVICE MANUAL SUPPLEMENTARY INFORMATION

Model AUTO ELECTRO FLASH 200X

Code No. 8668

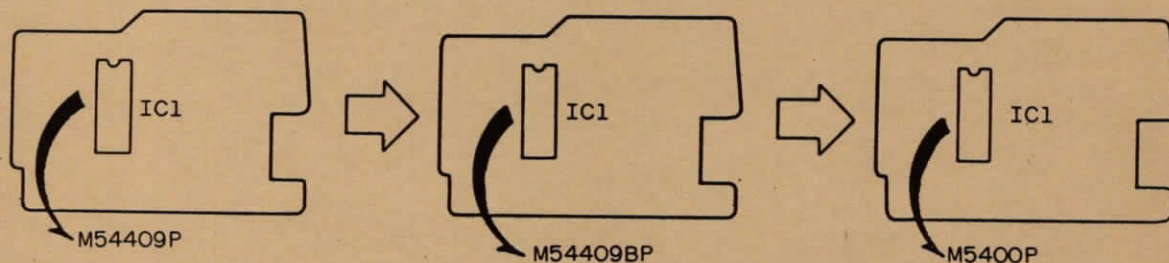
Summary of modifications for IC

For AUTO ELECTRO FLASH 200X (8668), IC had been modified twice, and with its modifications, printed base plate C set was modified also.

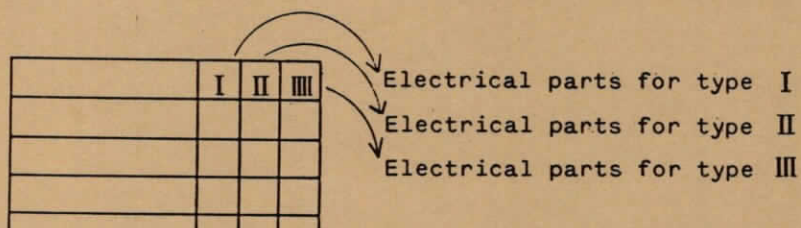
Please read the following items and add to your knowledge.

Explanation for Parts List

- ① Distinguish the printed base plate C sets by their IC numbers



②



I N D E X

- | | |
|---------------------------------------|----------|
| ① Printed base plate A set | -----P.2 |
| ② Printed base plate B set | -----P.3 |
| ③ Printed base plate C set | -----P.4 |
| ④ Wiring diagram of type I | -----P.5 |
| ⑤ Wiring diagram for types II and III | -----P.6 |
| ⑥ Circuit diagram for type I | -----P.7 |
| ⑦ Circuit diagram for type II | -----P.8 |
| ⑧ Circuit diagram for type III | -----P.9 |

Pracaution

Auxially code No. of printed base plate C set is not changed because it is replaceable with arrangement of wiring.

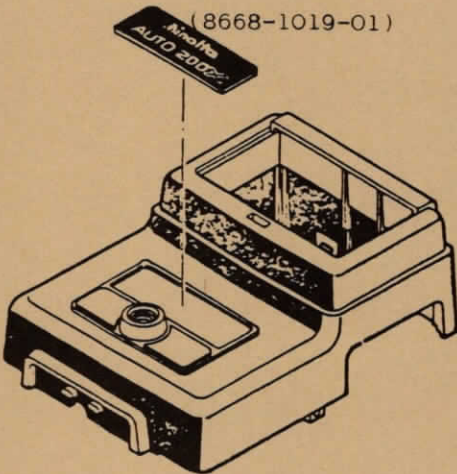
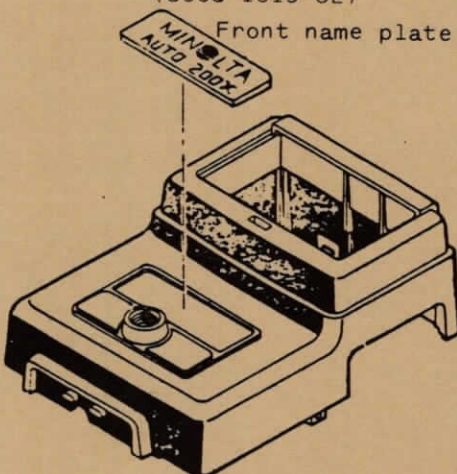
SERVICE MANUAL SUPPLEMENTARY INFORMATION

Model AUTO ELECTROFLASH 200X

Code No. 8668

■ List of parts changed as a result of logo change

■ The logo of AUTO ELECTROFLASH 200X (8668) has been changed, the parts change are as follows.

Old parts	New parts	Remarks (Parts list page)
<p>8668-0601-01</p> <p>(8668-1019-01)</p> 	<p>8668-0601-02</p> <p>(8668-1019-02) Front name plate</p>  <p>Body mold-A set</p>	(P.2)

■ Performance

Items	Description
Guide number	<ul style="list-style-type: none"> ● Charged completely 32 ± 0.5 Ev. ● Right after monitor lamp ON $32^{+0}_{-1.1}$ Ev. ● With wide pannel used W_1 (actual guide No. - 1 Ev) ± 0.2 Ev.
Recycle time	<ul style="list-style-type: none"> ● Monitor lamp should light within 10.0 sec. under following conditions : (Power supply.....5.8 V, 0.7 Ω, more than 1.5 A)
Voltage of monitor lamp lighting	<ul style="list-style-type: none"> ● Monitor lamp should light under following conditions : (Power supply5.4 V, 1.5 A) (Voltage of main condenser 285 ± 5 V)
Monitor circuit voltage	<ul style="list-style-type: none"> ● Voltage of monitor circuit should be within 330 ± 5 V under following conditions : (Power supply.....5.4 V, 2.5 A)

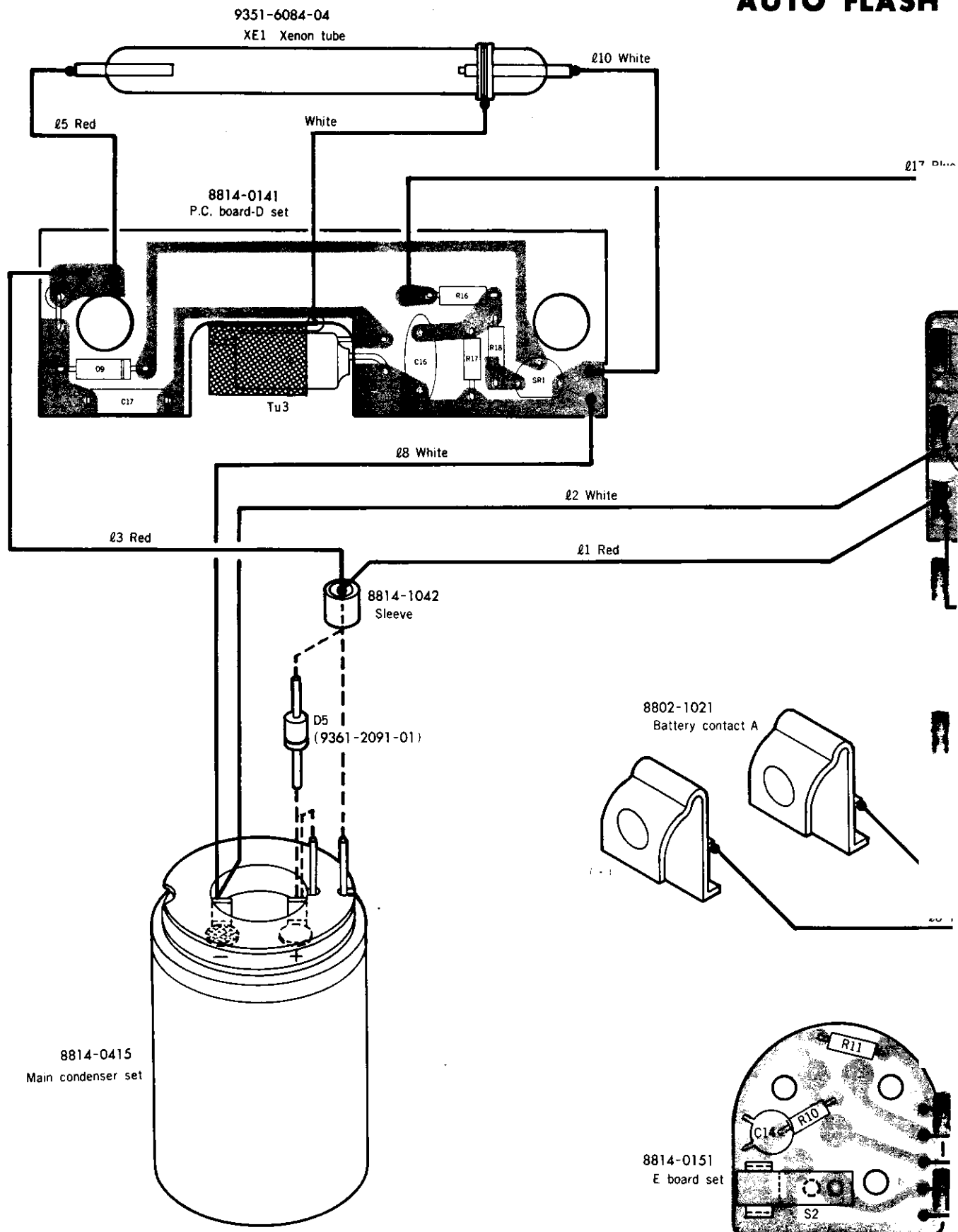
Inspection Standard

1. This standard specifies uniform performance levels for servicing in order to guarantee our product's quality to customers.
Each item is detailed so that you can follow this standard when you receive inquiries from users or are asked for checks.
2. When delivery or acceptance inspections are required, do not directly apply this standard to the performance measurements, but refer to the corresponding standard (manual).
3. Some users, because of their taste or special purposes, may require adjustment of this standard.
In this case, perform the adjustment according to the user's request whenever possible.

■ Performance

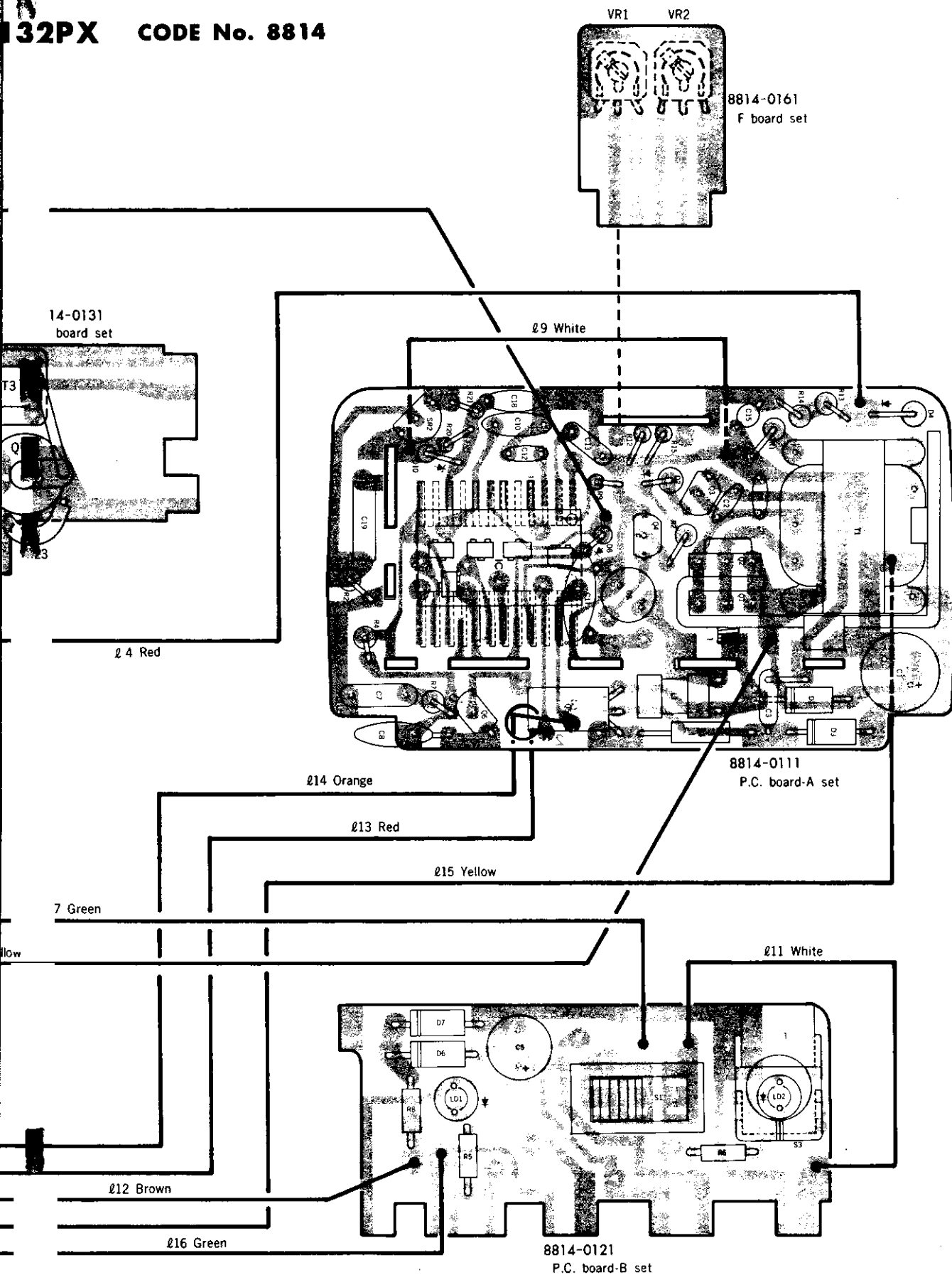
Items	Description
Monitor lamp	<ul style="list-style-type: none"> ● Red lamp should light when flash is ready to fire. ● Red lamp should go off when power switch is OFF.
FDC lamp	<ul style="list-style-type: none"> ● Green lamp should light for about 2 sec. in TTL and Sensor Auto modes if exposure is correct.
Power switch	<ul style="list-style-type: none"> ● Power should be ON and Red mark should appear when sliding it in the right direction. ● With shoe switch and power switch ON, oscillation should sound.
Shoe switch	<ul style="list-style-type: none"> ● Shoe switch should be ON with camera attached, and should be OFF with camera detached. <p>(Oscillation should sound with power switch ON when attaching it on camera.)</p>
Test button	<ul style="list-style-type: none"> ● Test button should operate smoothly without catching, and should return to original position with finger off.
Computer dial	<ul style="list-style-type: none"> ● The dial should operate smoothly with proper click stop. ● ASA film-speed ring should click-stop by 1/3 step from ASA 25 to 400, aligning the red dot with ASA index.
Bounce	<ul style="list-style-type: none"> ● Flash head should be tilted up to 90° from horizontal and/or rotated up to 90° to left or right. ● Angle should be varied with proper click-stop at following steps: Upward..... 0°, 50°, 65°, 90°
Battery chamber	<ul style="list-style-type: none"> ● With battery inserted, spring pressure of battery contact should be proper. ● With normal vibrations or impacts, there should be no possibility of contact failure. ● With wrong insertion (polarity), flash unit should not function, should not be influenced.

AUTO FLASH

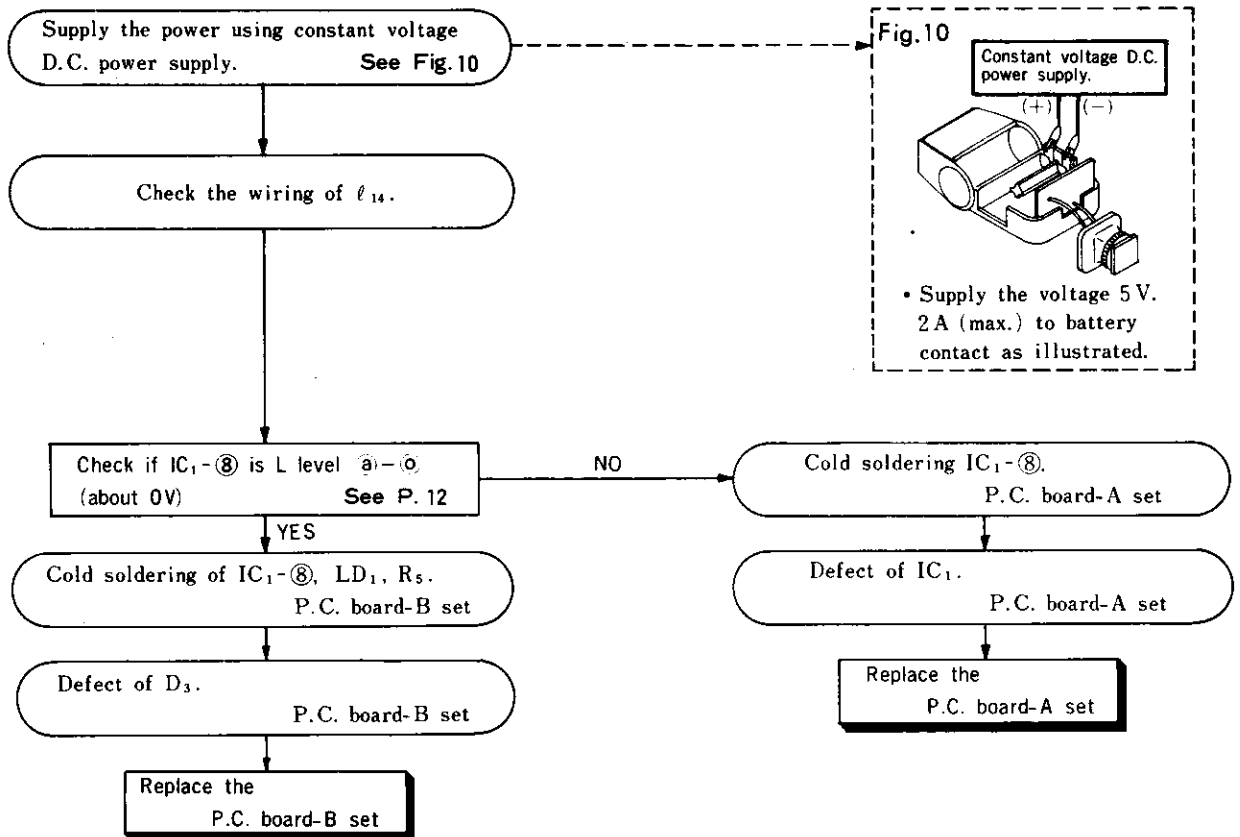


32PX

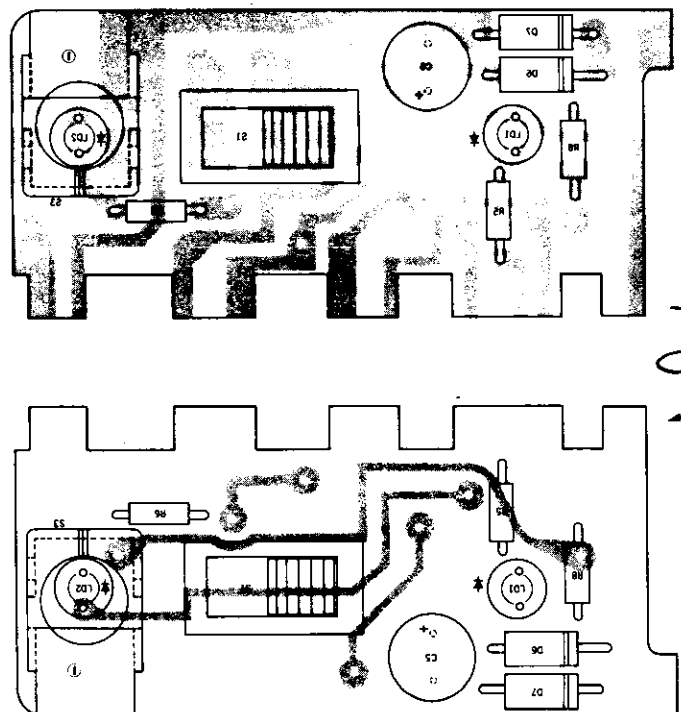
CODE No. 8814



6. FDC does not work

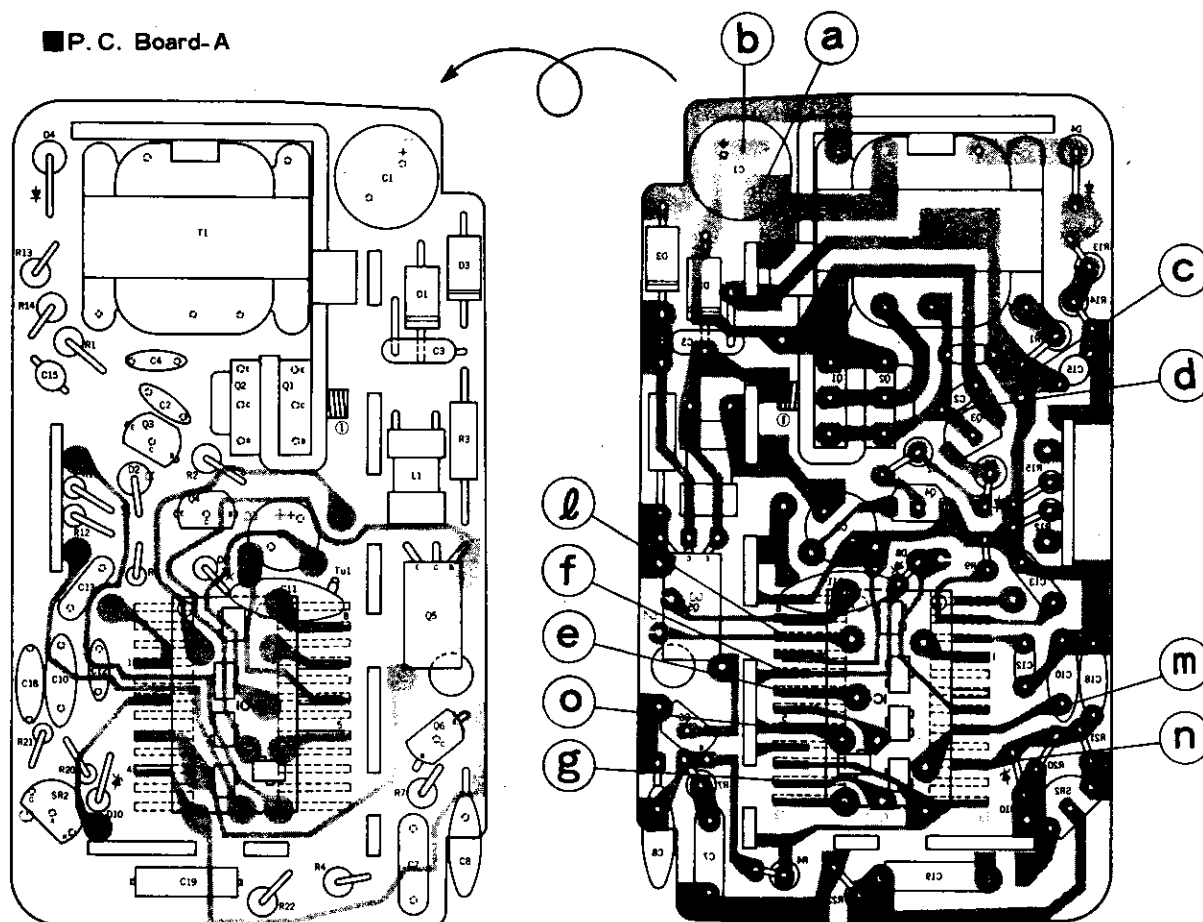
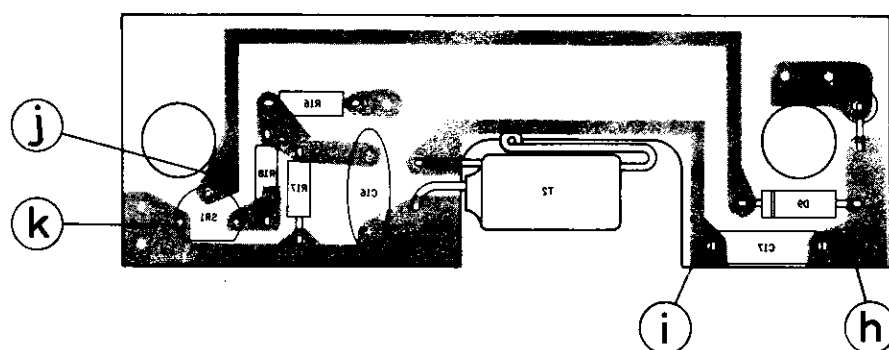
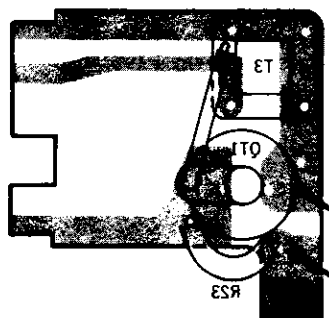
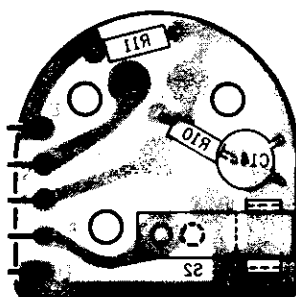
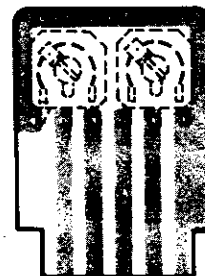


■ P.C. Board-B



Precautions

- When measuring voltage, printed wiring you can touch is only designated one, since measuring position is limited.

■ P. C. Board-A**■ P. C. Board-D****■ Board-C****■ Board-E****■ Board-F**

■ Subsuuary materials

■ Grease

- Losimol 79111

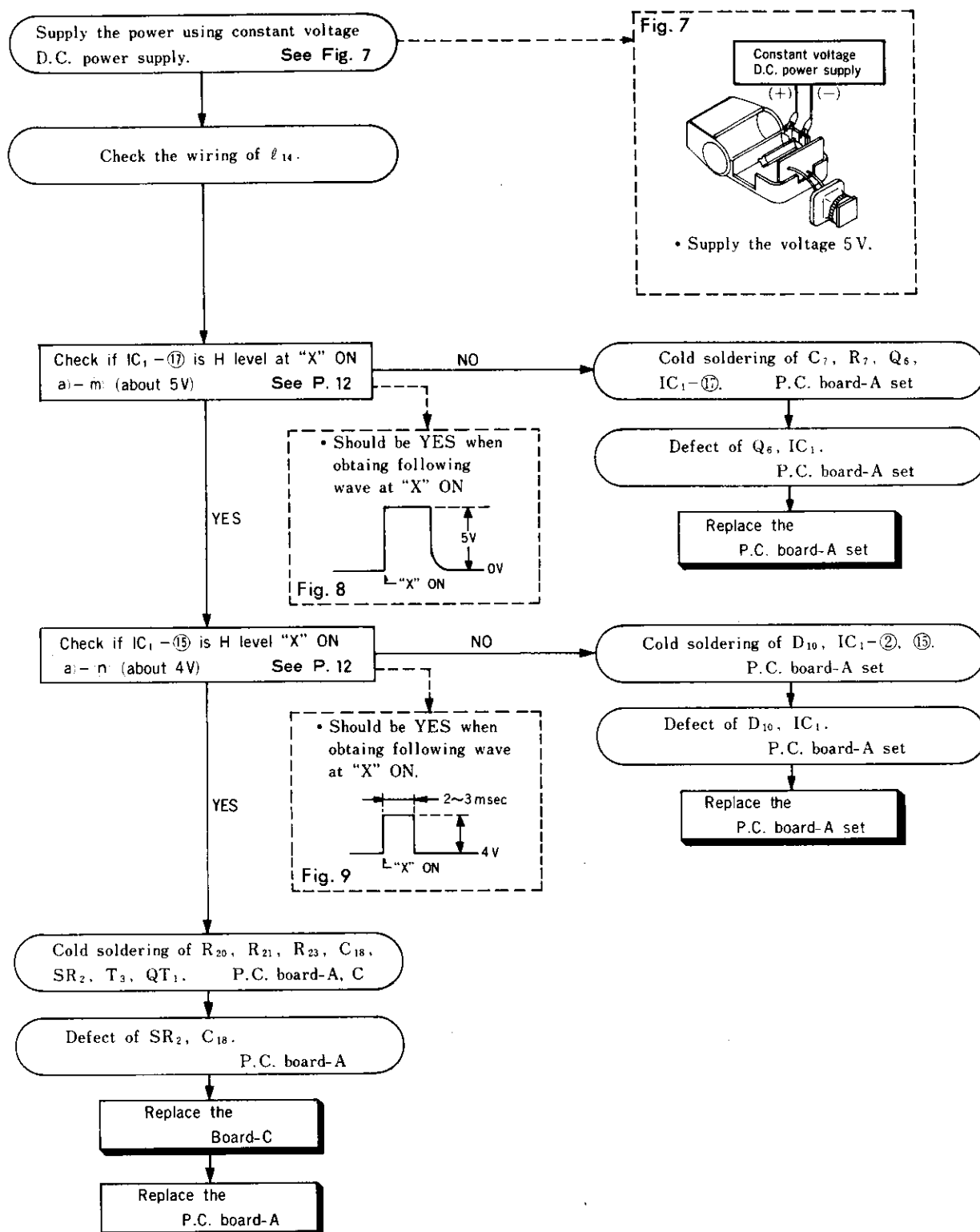
■ Adhesive agents

- Bond G-17

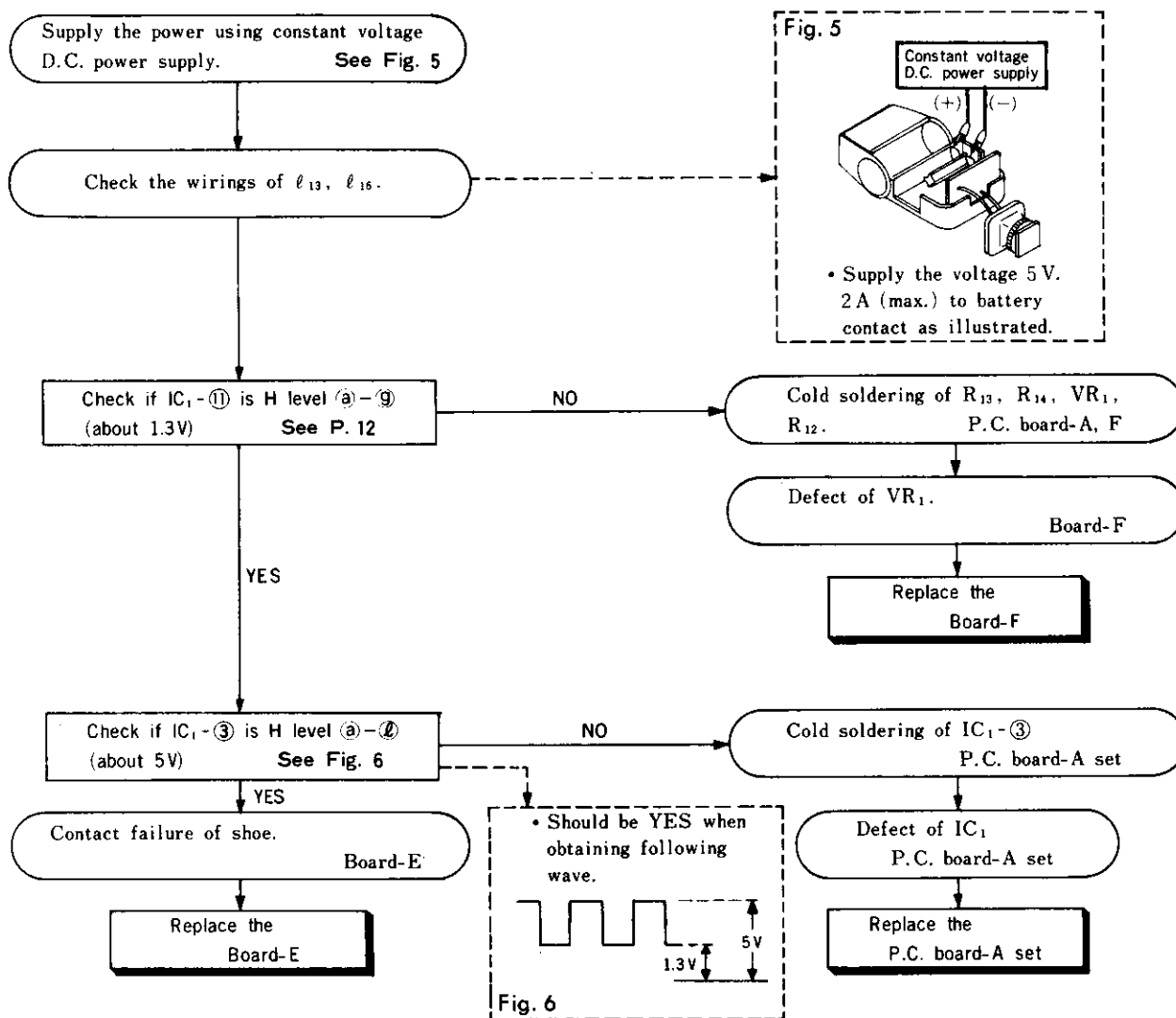
■ Cleaner

- Flonsolve

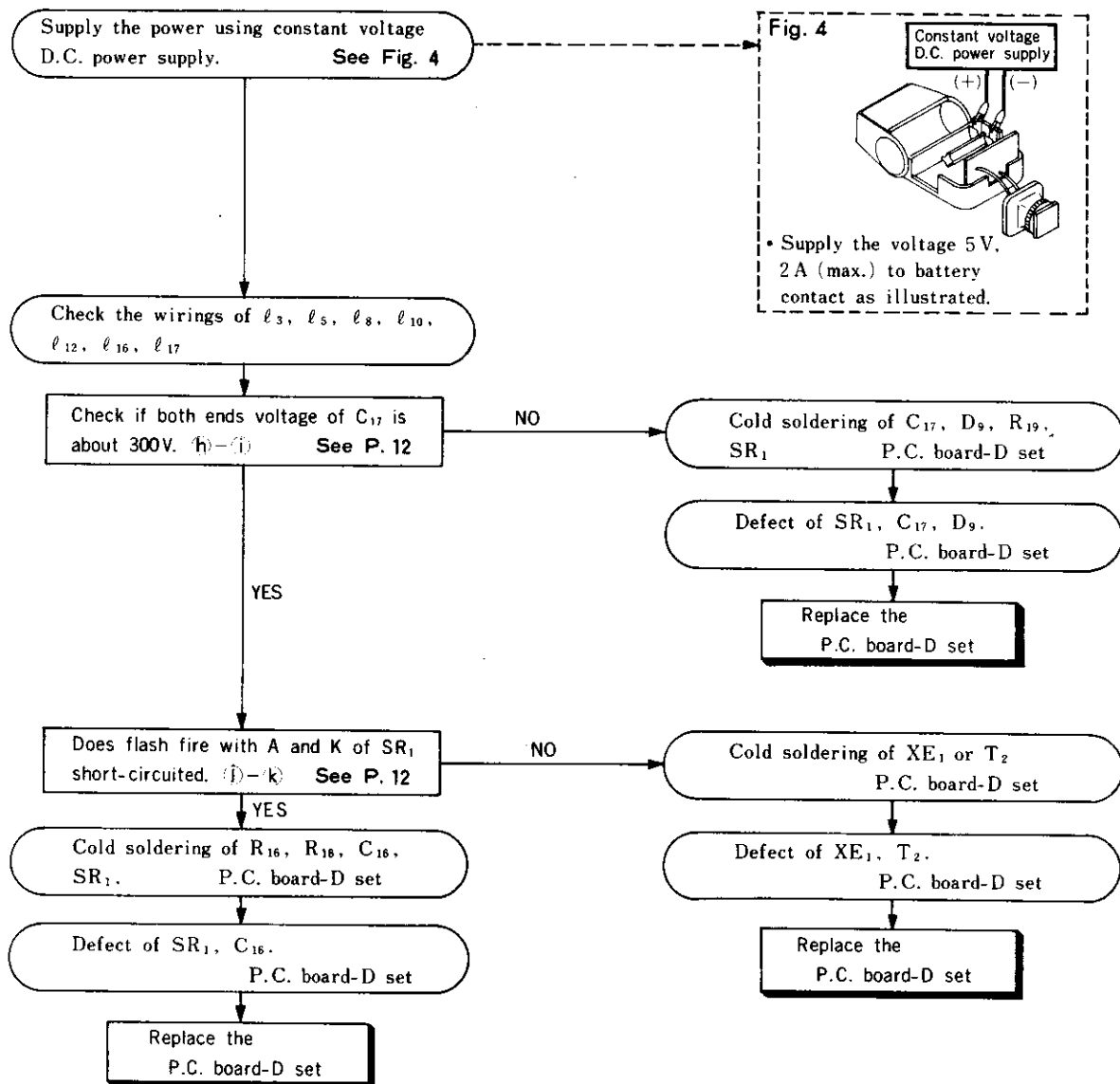
5. Fired fully in TTL mode



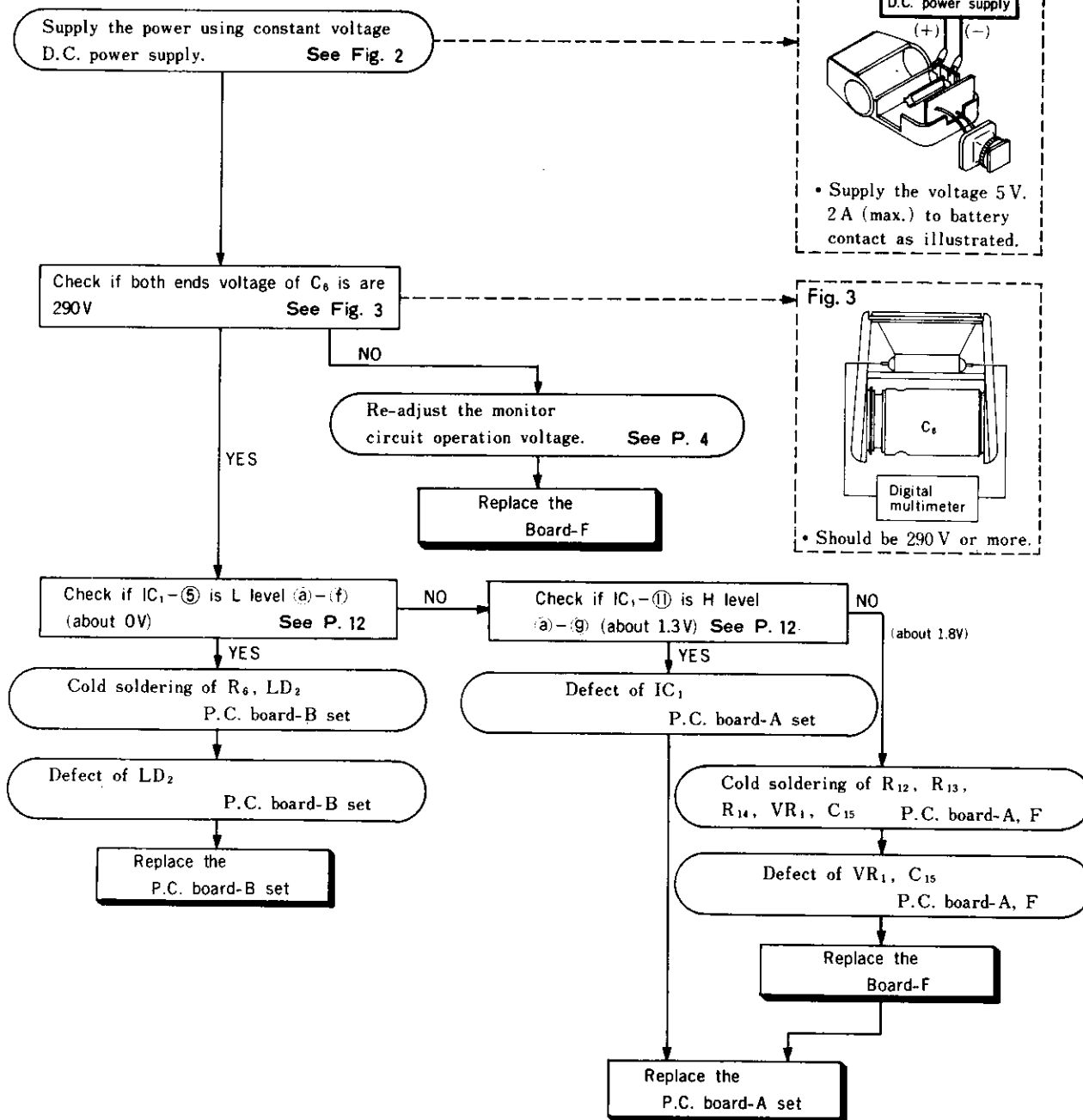
4. Flash-ready signal (Voltage of C_6 is 300 V or more)



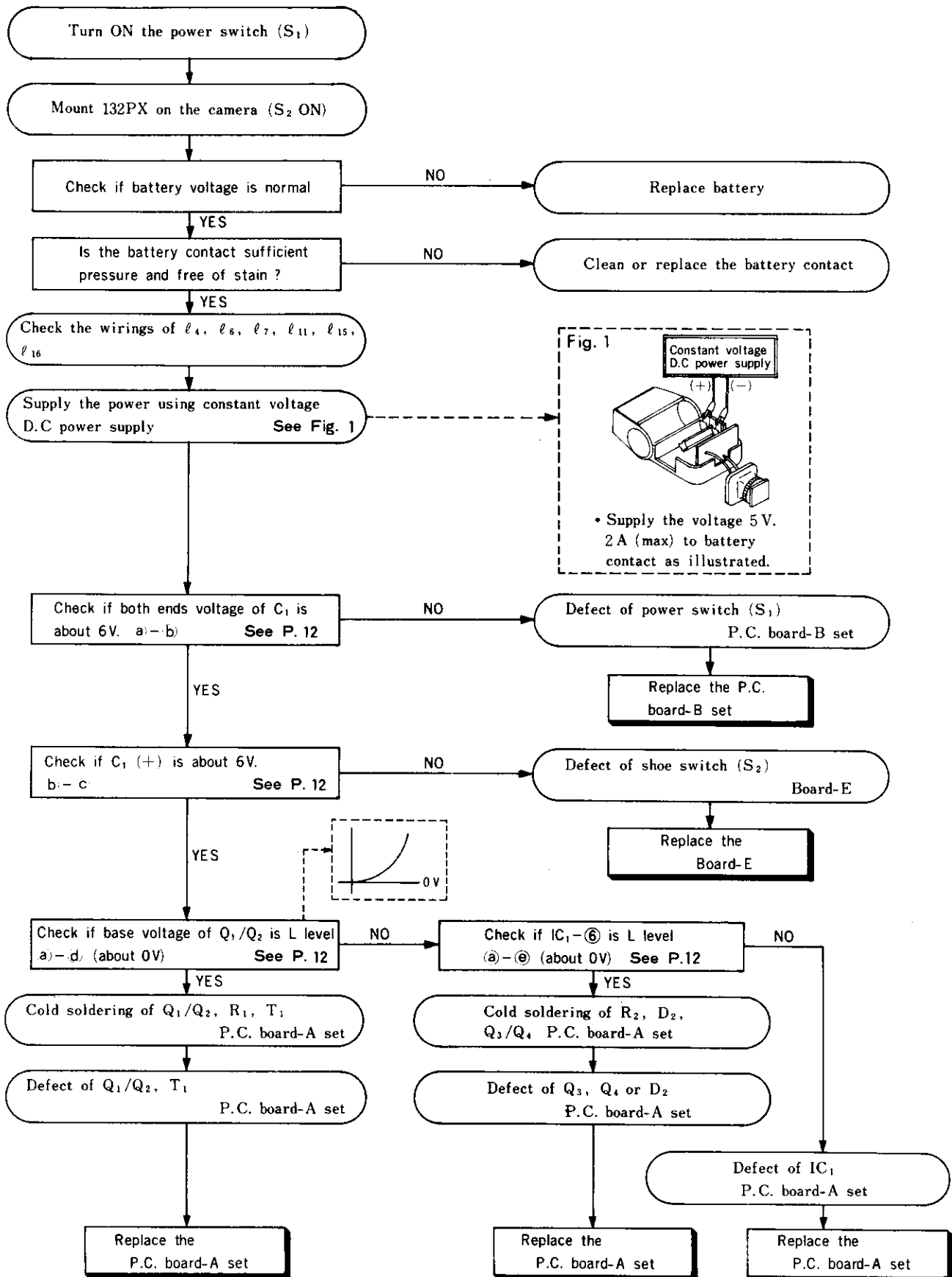
3. No flashing (Voltage of C_6 is 300V or more)



2. Monitor lamp does not light up



1. No oscillation sound



Trouble-Shooting Chart

1. General

1. This chart includes symptoms and causes of troubles on the Auto electro flash 132PX.
2. This chart will be useful with reference page (P. 12).

2. Contents of chart

1. Described in this chart are only the single causes of trouble, which cannot cover all possibilities.
For trouble involving combined causes, make overall investigations with reference to the individual causes.

3. Precautions

1. The digital tester (type 2507) should basically be used for measuring. Other instruments can also be used, if their input impedance is 10 M ohms or more.
2. To check voltage, use the specified measuring instrument.
For continuity check use tester (less than 3V), and for wave check, oscilloscope.
3. IC, diode, transistor, resistor, condenser, etc. may cause almost no trouble. Therefore, check trouble with an emphasis on soldering of leads, electrical parts, and switch mechanisms.
4. For lead wire check, refer to wiring diagram.
5. When measuring voltage, printed wiring you can touch is only designated one, since measuring position is limited.
6. When disassembling, discharge the main condenser (C_6) in accordance with procedure (Refer to P. 2 Fig. 1).
7. Keep the soldering iron temperature at $300 \pm 10^\circ \text{C}$. If impossible, solder in a short time as much as possible.
(It is desirable to use a soldering iron with a grounding wire attached, or a ceramic heater type soldering iron.)

4. INDEX

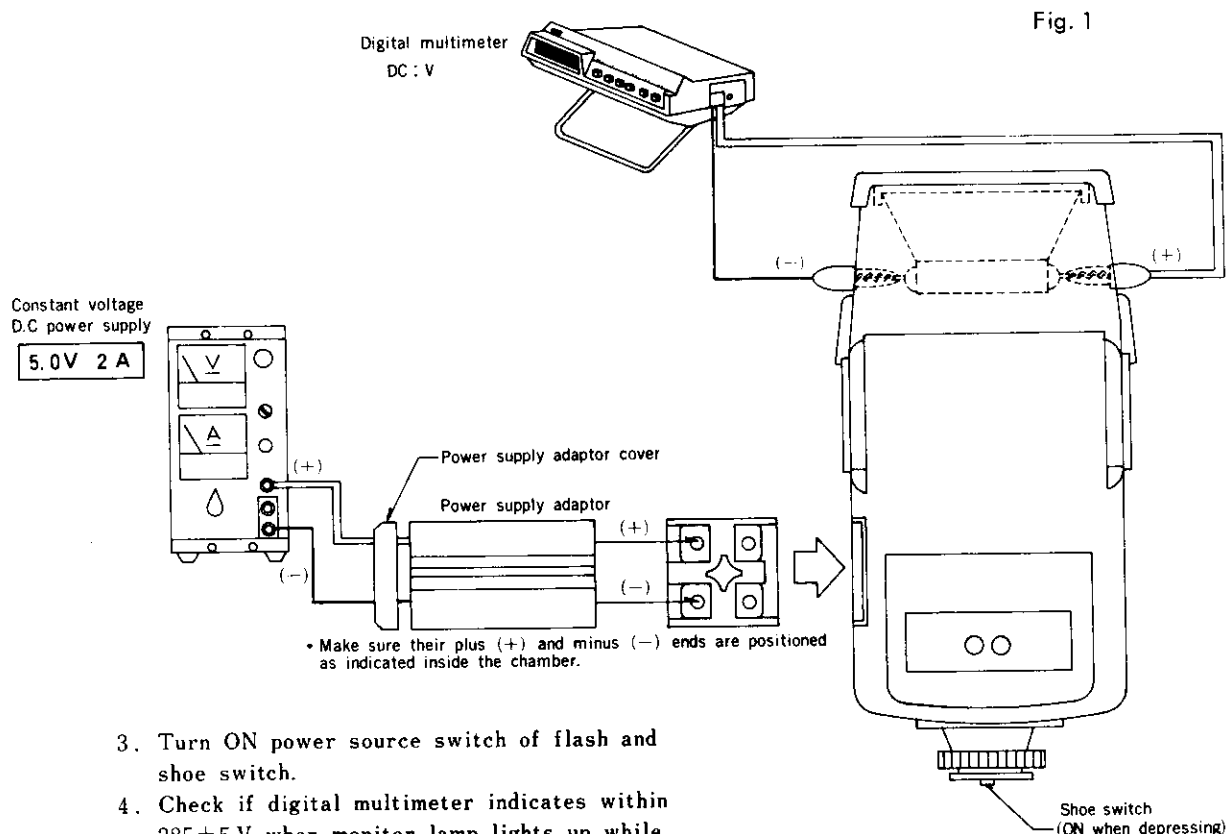
1. No oscillation sound	P. 7
2. Monitor lamp does not light up	P. 8
3. No flashing (Voltage of C_6 is 300V or more)	P. 9
4. Flash-ready signal	P. 10
5. Fired fully in TTL mode	P. 11
6. FDC does not work	P. 12

■ Voltage adjustment of Monitor-lamp/circuit

- Measuring instruments : Constant voltage D.C power supply (Model 524B, E-1, E-2)
 : Digital multimeter (Model 2508, 3476, 2507)
 : Power supply adaptor (8646-1034-79, 0461-1023-75)
 : Power supply adaptor cover (Refer to P. 13)
 : Luminance correcting screwdriver-B

1 Voltage adjustment of monitor lamp lighting

1. After the Flash cover-D (1013) and Name plate (1020).
2. Set the measuring instruments as Fig. 1



3. Turn ON power source switch of flash and shoe switch.
4. Check if digital multimeter indicates within 285 ± 5 V when monitor lamp lights up while flash charging.
5. When digital multimeter indicates the value out of 285 ± 5 V, adjust it turning VR_1 .
 • Before the adjustment, flash the unit once without fail.

2 Voltage adjustment of monitor circuit

1. Set the measuring instruments as shown above.
2. Adjust the voltage of monitor circuit* turning VR_2 when monitor circuit operates as flash ready to obtain within 330 ± 5 V.

* Functioning diagram of monitor circuit

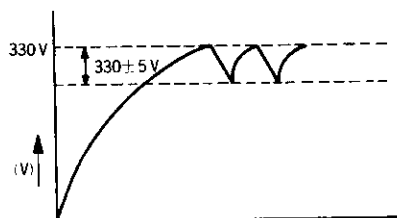
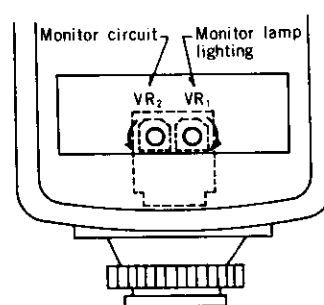


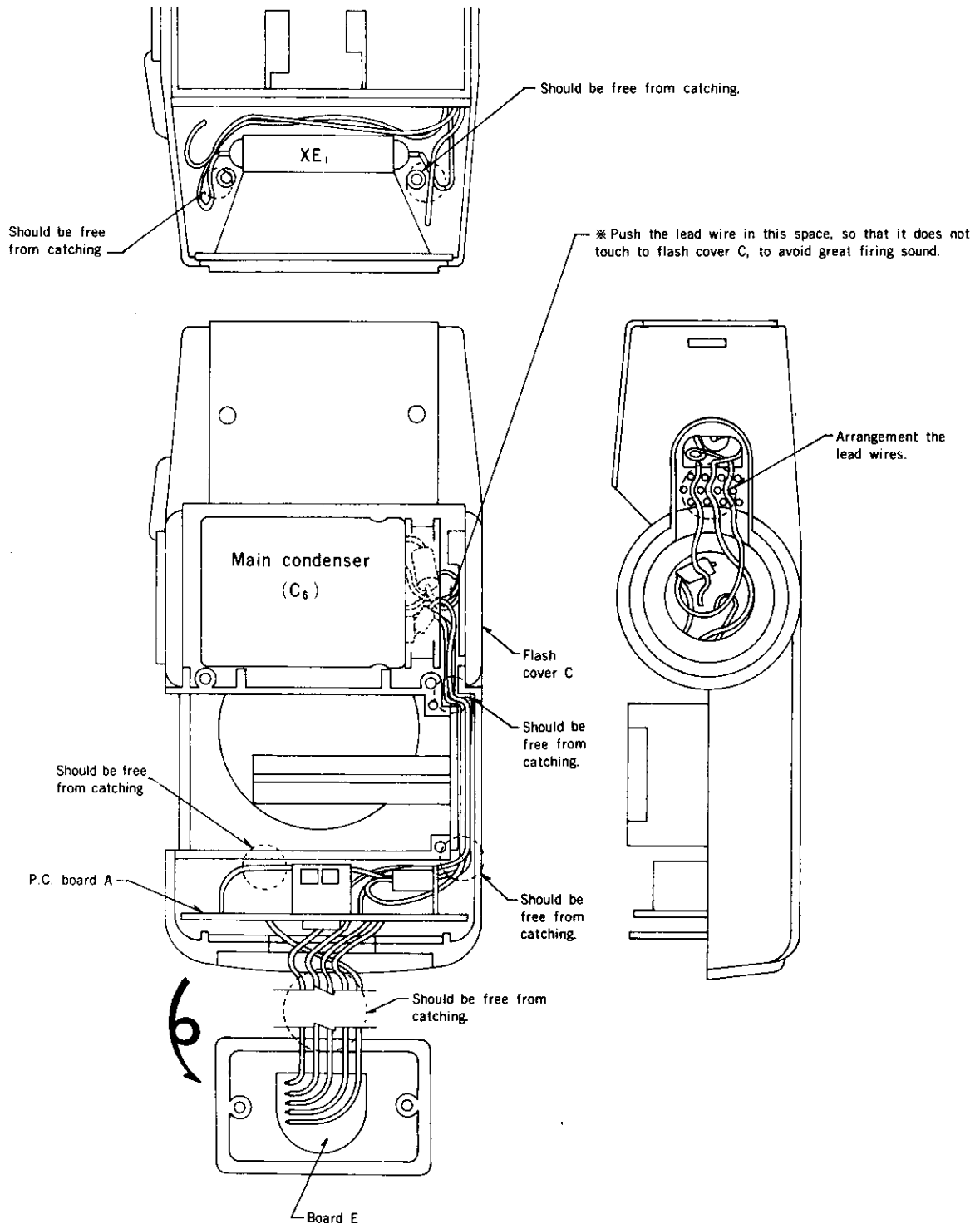
Fig. 2



- When turning VR in the direction of arrow, voltage is decreased.

■ Lead Wire Arrangement

- Be sure to arrange the lead wires as illustrated below.

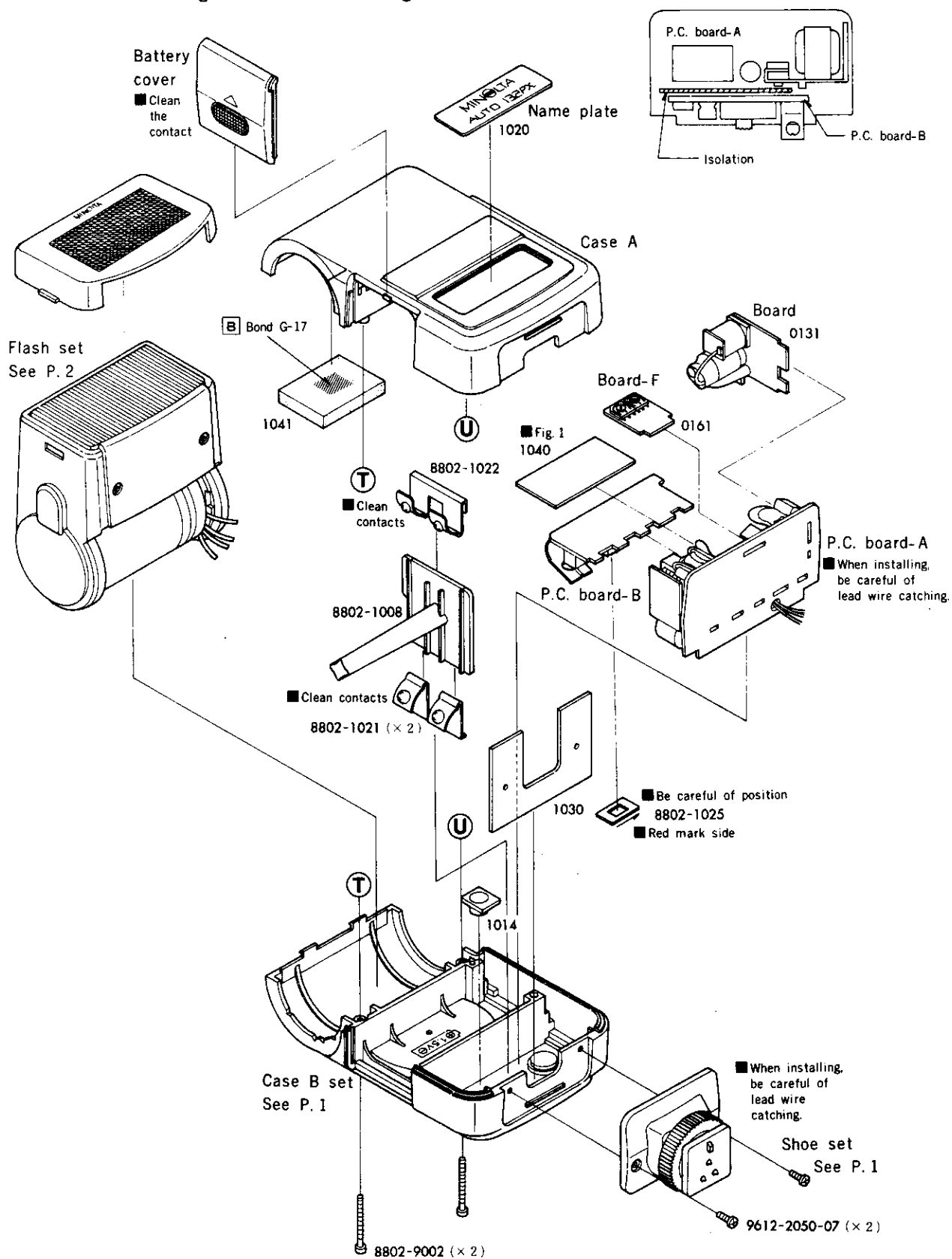


3 Main body assembly

■ Before disassembling, discharge the main condenser first.

■ When assembling, see "Lead wire arrangement" on P. 4.

■ Fig. 1 Installing position of isolation sheet.

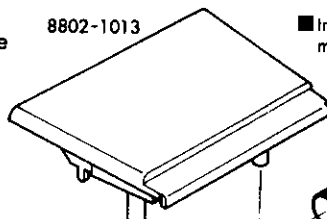


2 Flash head assembly

■ Before disassembling, discharge the main condenser first (refer to Fig. 1)

■ Assemble the parts in the order of ①~⑩.

■ Fig. 1 Discharge procedure of main condenser

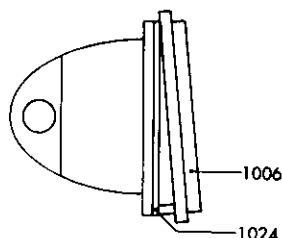


■ Install it after monitor voltage checking of monitor lamp and operation.

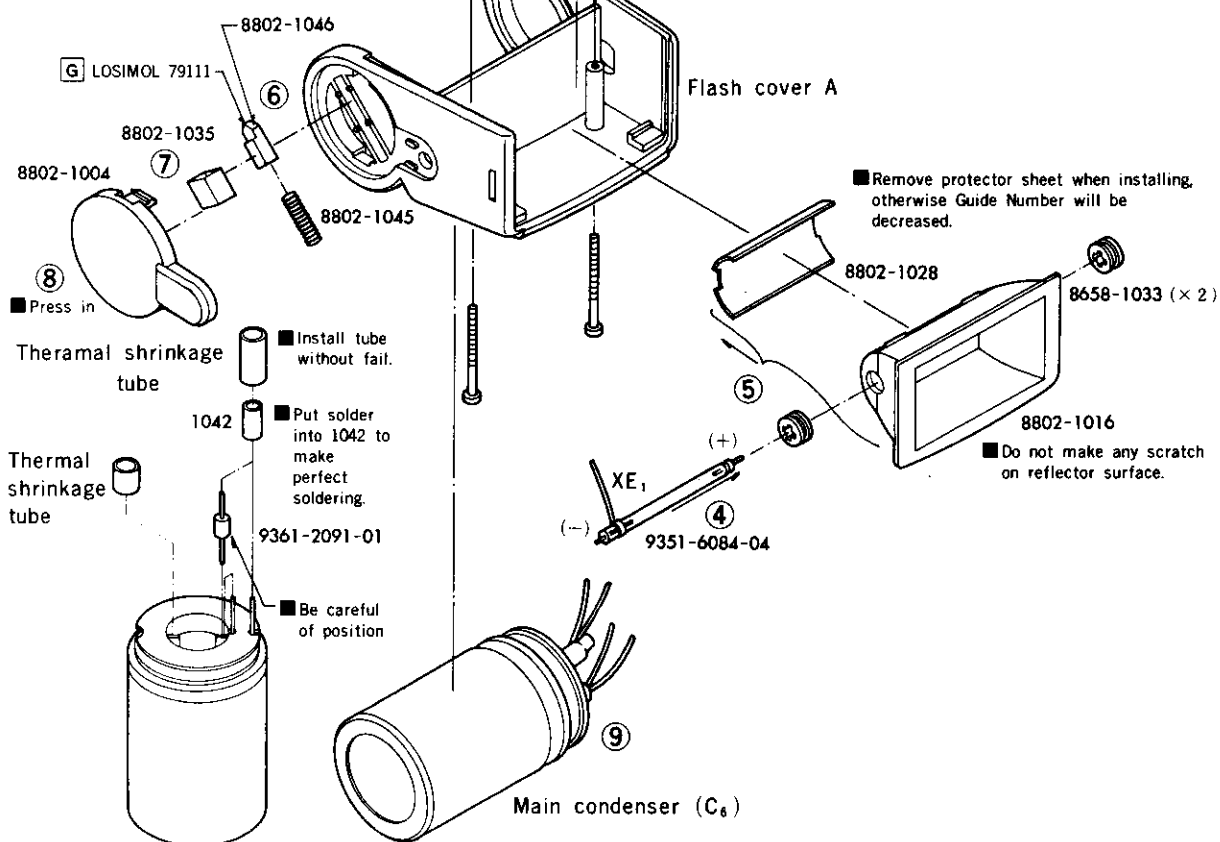
■ Make sure that lead wire should be free from catching.

• Make sure that it is discharged completely.

■ Fig. 2 1006, 1024 installing method.

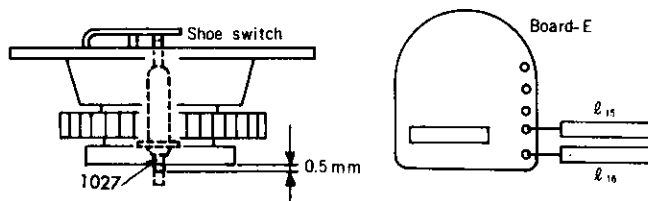


• Install the 1024 in position as illustrated.

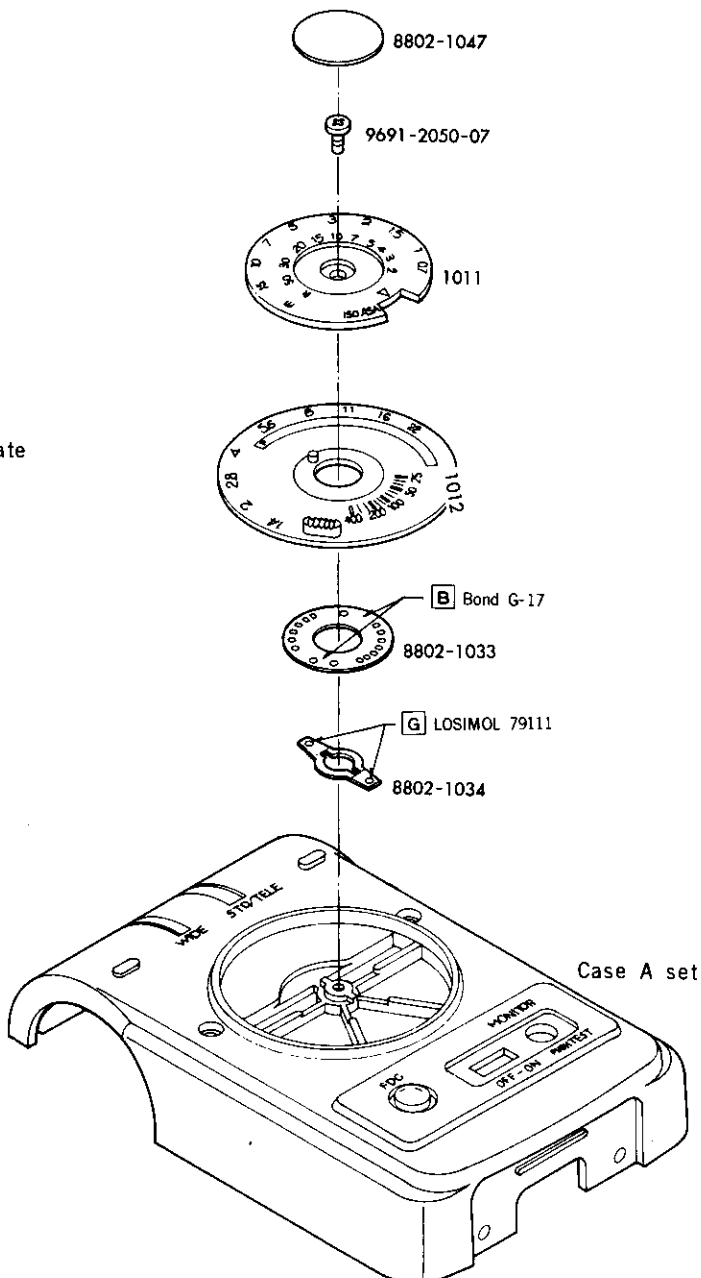
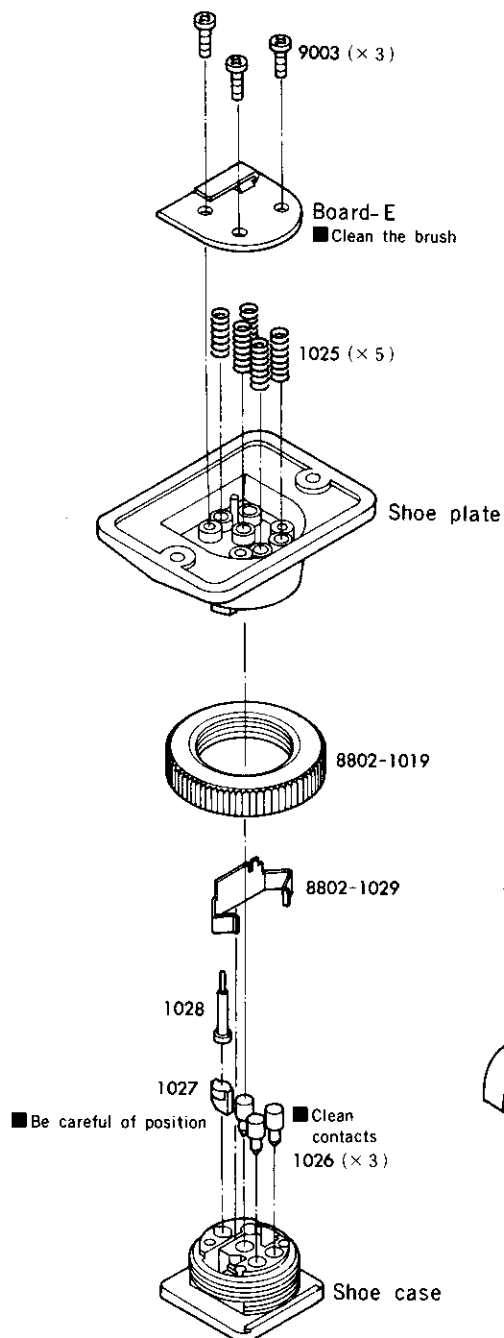


1 Exposure dial base plate/shoe assembly

■ Fig. 1 Checking procedure of shoe switch.



- Shoe switch should be ON when depressing shoe switch (1027), however, its stroke should be 0.5 mm or more after switched ON. (Check both ends of L15 and L16 using circuit tester.)
- Shoe switch should not be ON when releasing shoe switch depressing.



REPAIR GUIDE

- The contents of this manual are in accordance with the assembly procedure. Therefore, follow the reverse procedure when disassembling.

■ Description of marks used in REPAIR GUIDE

- : Point of assembly and general caution
- G : Grease used and part to be greased
- B : Adhesive used and part to be glued

■ Assembly and Adjustment Procedure

- 1 Exposure dial base plate/shoe assembly (Board-E) P. 1
- 2 Flash head assembly (XE, P.C. board-D set, Main condenser, H case) P. 2
- 3 Main body assembly (P.C. board-A, -B, -C, -F) P. 3
- Lead wire arrangement P. 4
- Voltage adjustment of Monitor lamp/circuit P. 5

■ Trouble-shooting Chart P. 6 ~ P. 12

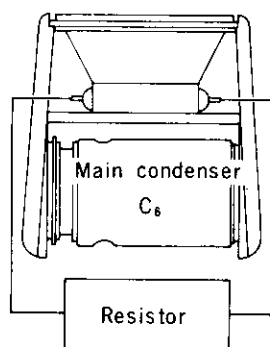
■ Measuring instruments, tools, subsidiary P. 13

■ Wiring diagram

■ Precautions

1. Since this electroflash uses many resin parts, use Flonsolve or Alcohol whe cleaning. Never use Thinner, Ketone or Ethyl.
2. When disassembling, discharge the main condenser first in accordance with following procedure.

(Discharge procedure)



- Make shortcircuit using resistor (200-300/3 W)
- Make sure that it is discharged completely.

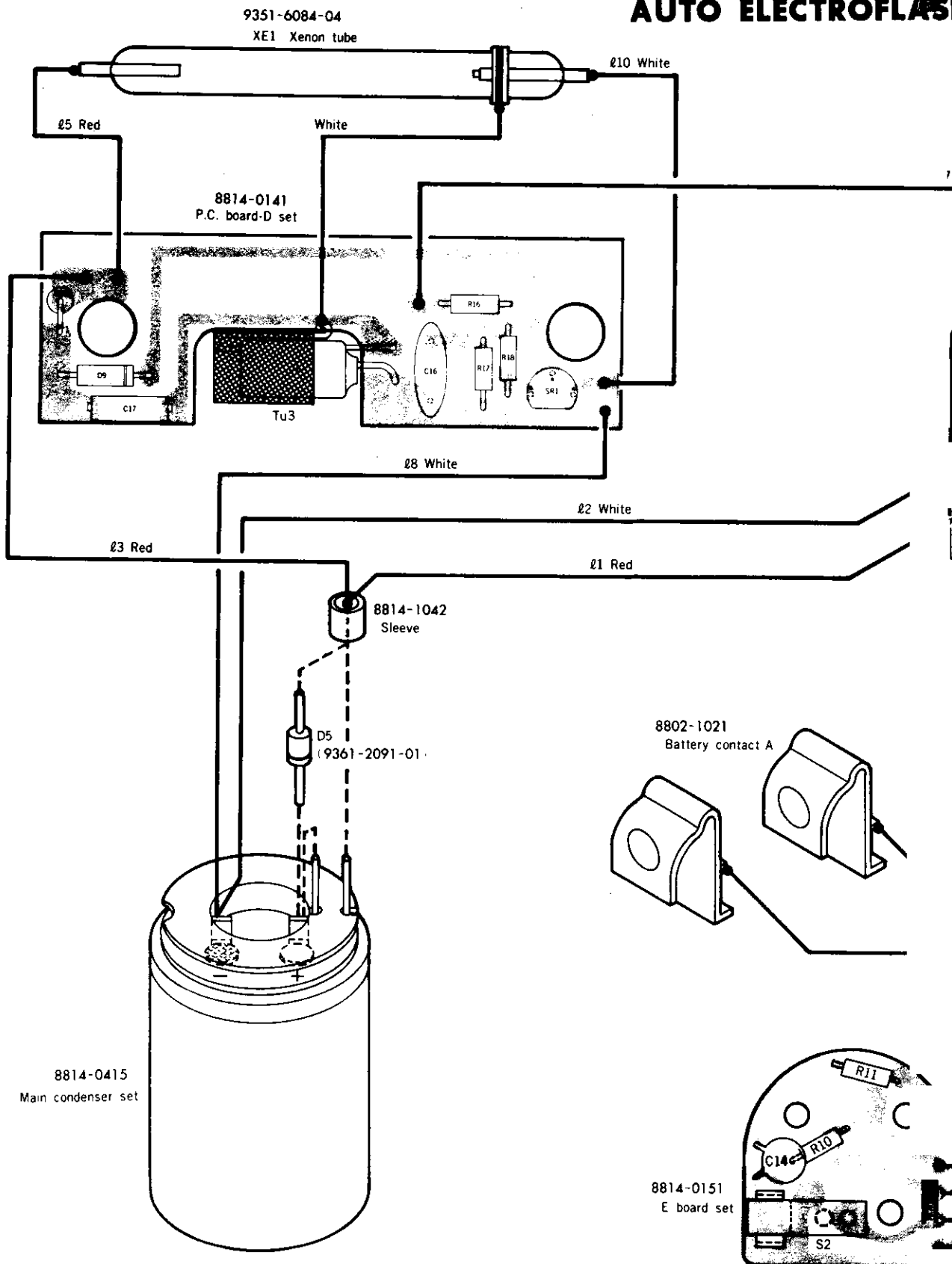
Lead wires list

Symbol	Part No.	Color	Type			Qty.
ℓ1	9393-2401-02	Red	UL1007	AWG 24	ℓ = 110	1
ℓ2	9393-2401-09	White	UL1007	AWG 24	ℓ = 115	1
ℓ3	9393-2608-02	Red	UL1061	AWG 26	ℓ = 90	
ℓ4	9393-2608-02	Red	UL1061	AWG 26	ℓ = 70	1
ℓ5	9393-2608-02	Red	UL1061	AWG 26	ℓ = 50	1
ℓ6	9393-2608-04	Yellow	UL1061	AWG 26	ℓ = 90	1
ℓ7	9393-2608-05	Green	UL1061	AWG 26	ℓ = 100	1
ℓ8	9393-2608-09	White	UL1061	AWG 26	ℓ = 130	1
ℓ9	9393-2608-09	White	UL1061	AWG 26	ℓ = 30	1
ℓ10	9393-2608-09	White	UL1061	AWG 26	ℓ = 50	1
ℓ11	9393-2608-09	White	UL1061	AWG 26	ℓ = 35	1
ℓ12	9393-2808-01	Brown	UL1061	AWG 28	ℓ = 65	1
ℓ13	9393-2808-02	Red	UL1061	AWG 28	ℓ = 55	1
ℓ14	9393-2808-03	Orange	UL1061	AWG 28	ℓ = 60	1
ℓ15	9393-2808-04	Yellow	UL1061	AWG 28	ℓ = 65	1
ℓ16	9393-2808-05	Green	UL1061	AWG 28	ℓ = 65	1
ℓ17	9393-2808-06	Blue	UL1061	AWG 28	ℓ = 180	1

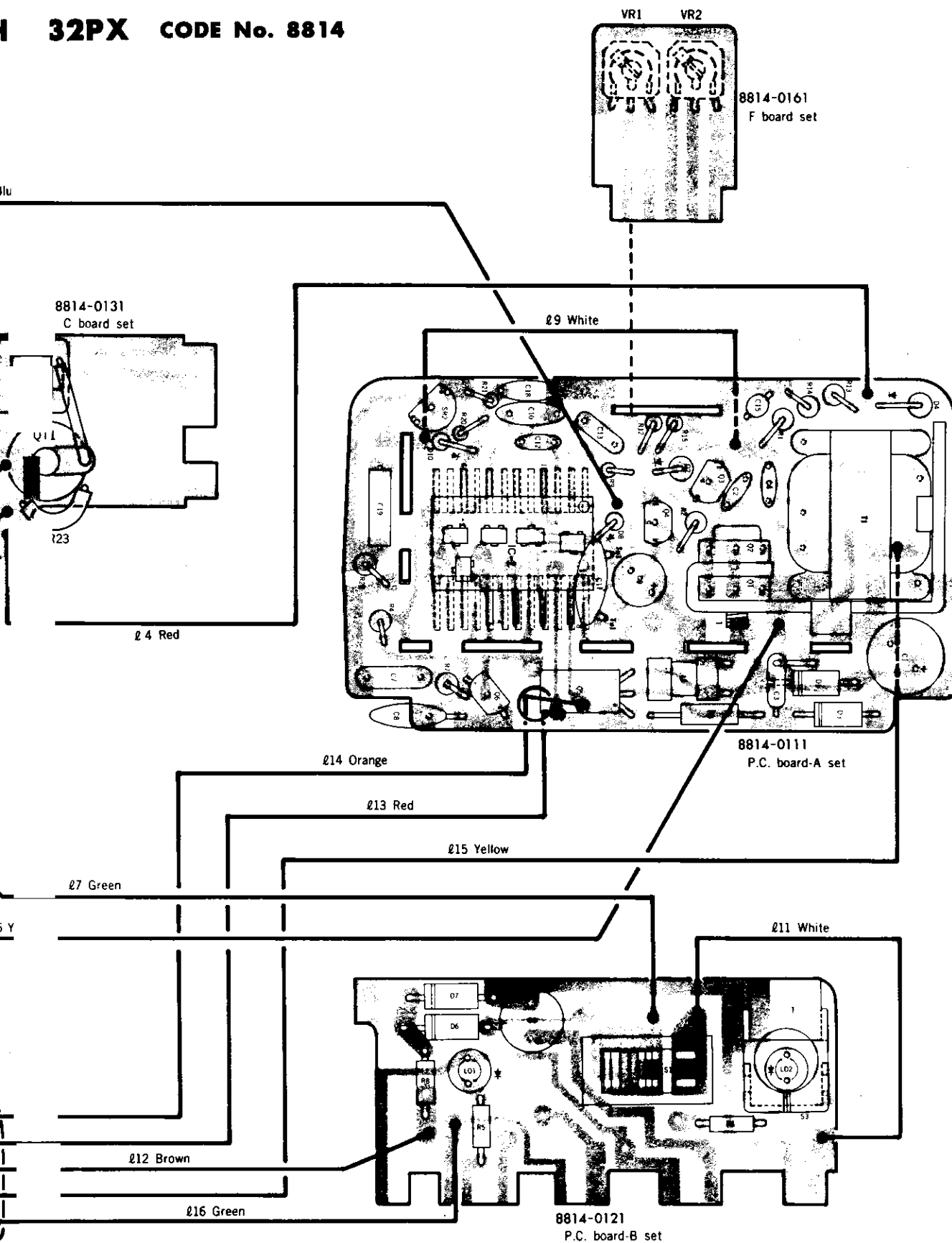
Above lead wires must be ordered in lengths rounded to nearest meter.

上記リード線の供給は1m単位です

AUTO ELECTROFLASH



32PX CODE No. 8814



Assy. Part No. 8814-0121-01

Assy. Part Name; P C board-B set

プリント基板Bセット

Symbol	Part No.	Com.	Part Name	Typ.	Qty.
D6,D7	9361-2080-01		Diode	TFR-IT	2
LD1	9353-2082-03		LED	BG3432S	1
LD2	9353-2082-04			PR3432S	1
R5	9422-2416-81		Fixed resistor	1/8W 240Ω	1
R6	9422-2716-81			1/8W 270Ω	1
R8	9422-2216-81			1/8W 220Ω	1
C5	9511-1075-81		Electrolytic condenser	100μF/6.3V	1
S1	9333-2081-03		Switch	SS258A	1
1	8814-1037-01		Test button spring		1

Assy. Part No. 8814-0141-01

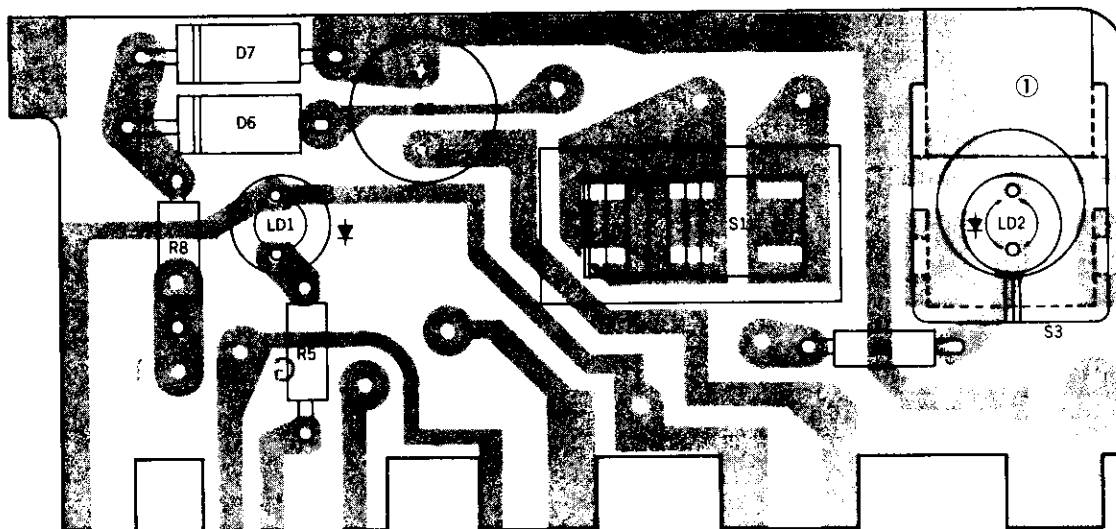
Assy. Part Name; P C board-D set

プリント基板Dセット

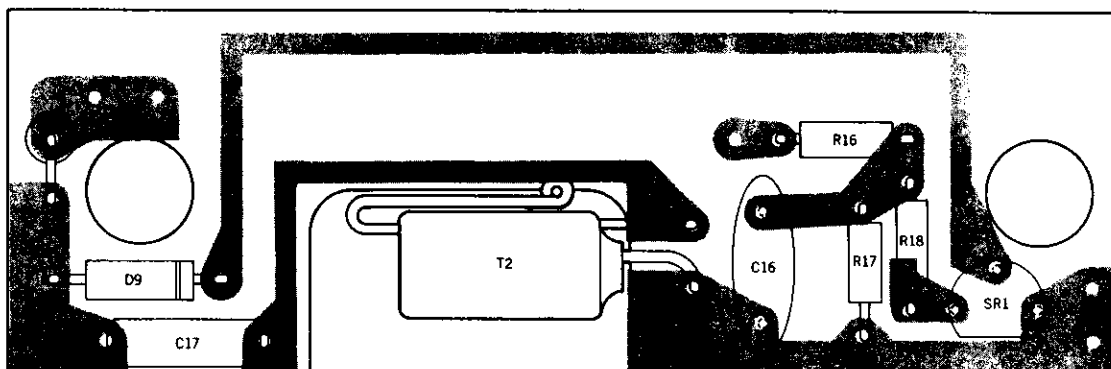
Symbol	Part No.	Com.	Part Name	Typ.	Qty.
D9	9361-2091-01		Diode	DFB-03R	1
SR1	9365-1082-01		SCR	SFOR3G42	1
R16,R17	9422-8216-81		Fixed resistor	1/8W 820Ω	2
R18	9422-1016-81			1/8W 100Ω	1
R19	9423-1556-81			1/4W 1.5MΩ	1
C16	9563-4735-86		Ceramic	Condenser	0.047μF/12V
C17	9597-4733-84		Mylar		0.047μF/250V
T2	9324-2081-01		Transformer	NC-850	1

AUTO ELECTROFLASH 132PX
CODE No. 8814

Assy. Part No. 8814-0121-01



Assy. Part No. 8814-0141-01



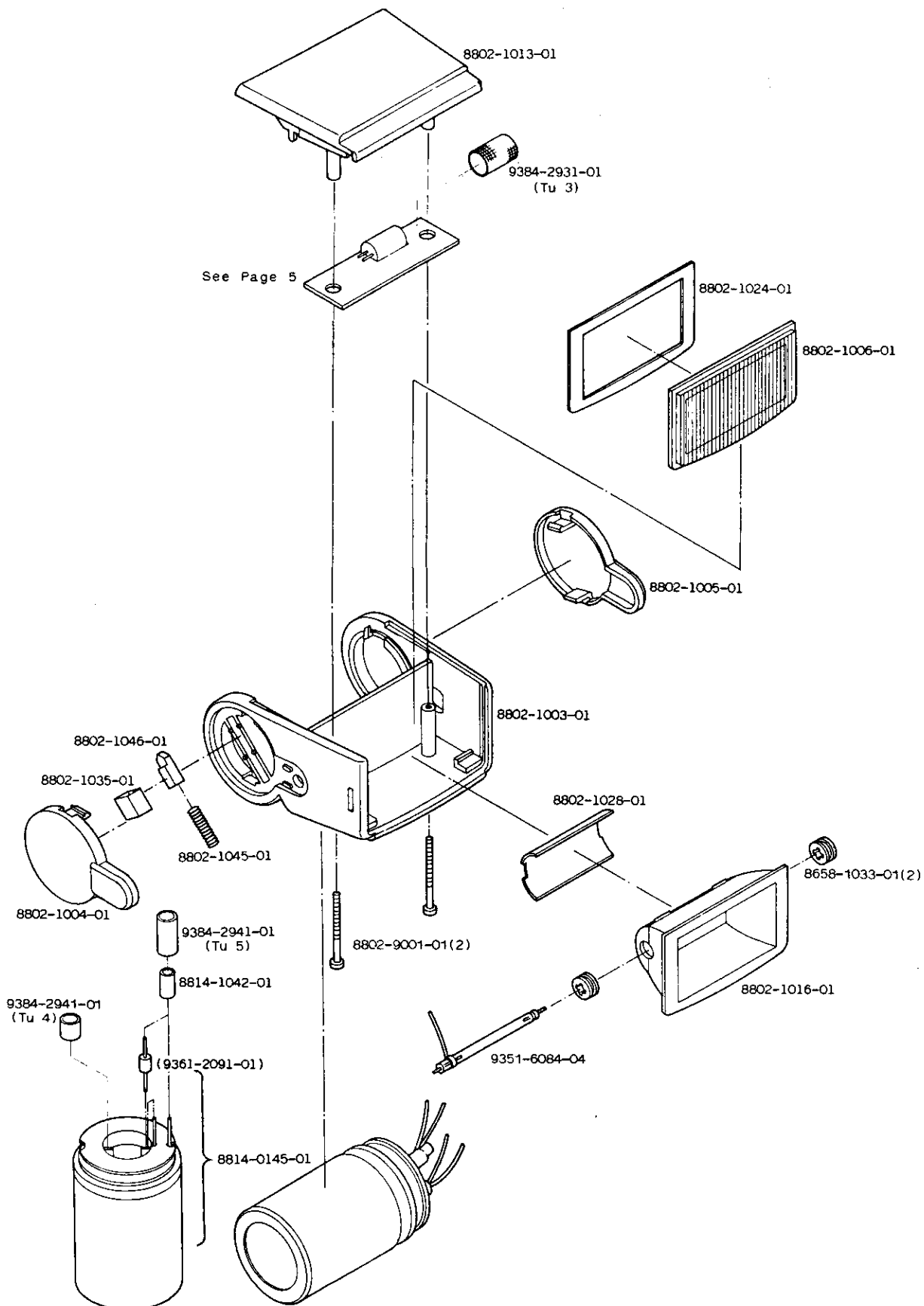
Assy. Part No. 8814-0111-01

Assy. Part Name: P C board-A set

プリント基板Aセット

Symbol	Part No.	Com.	Part Name	Typ.	Qty.
IC1	9360-0080-04		I C	M54415P	1
IC2	9366-5085-01			SS5701	1
D1, D3	9361-2080-09		Diode	TVR-1D	2
D2, D4	9361-2091-01			DFB-03R	2
D8	9361-2084-04			MA-150	1
D10	9361-4081-04		Zenner diode	MZ-304	1
Q1, Q2	9363-1081-04		Transistor	2SA1120(Y)	2
Q3, Q6	9363-1082-01			2SA1115	2
Q4	9362-1082-01			2SC2603	1
Q5	9362-2082-01			2SC3244	1
SR2	9365-1082-01		SCR	SFOR3G42	1
R1	9423-2226-81		Fixed resistor	1/4W 2.2K Ω	1
R2	9423-1526-81			1/4W 1.5K Ω	1
R3	9423-1536-81			1/4W 15K Ω	1
R4	9423-1036-81			1/4W 10K Ω	1
R7	9423-2236-81			1/4W 22K Ω	1
R9	9422-5644-81			1/8W 560K Ω	1
R12,R15	9422-1036-81			1/8W 10K Ω	2
R13	9433-9146-83			1/4W 910K Ω	1
R14	9423-6846-81			1/4W 680K Ω	1
R20	9422-4716-81			1/8W 470 Ω	1
R21	9422-4706-81			1/8W 47 Ω	1
R22	9423-3356-81			1/4W 3.3M Ω	1
C1	9512-1076-85		Electrolytic	100 μ F/10V	1
C2 C4 C12	9565-4725-86		Ceramic	4700PF/50V	3
C3	9597-6824-81		Mylar	6800PF/250V	1
C7	9597-2234-81			0.022 μ F/250V	1
C8	9563-4735-86		Ceramic	0.047 μ F/12V	1
C9	9511-3375-81		Electrolytic	330 μ F/6.3V	1
C10	9563-1045-86		Ceramic	Condenser	0.1 μ F/12V
C11	9595-6835-81		Mylar		0.068 μ F/50V
C13	9595-1023-81				1000PF/50V
C15	9534-1055-83		Tantalum		1 μ F/25V
C18	9565-3325-86		Ceramic		3300PF/50V
C19	9597-4733-84		Mylar		0.047 μ F/250V
T1	9324-1081-09		Transformer	SA161	1
L1	9324-5085-01		Coil	SS-1	1
Tu1	9384-2905-01		Tube		2
①	8814-9004-01		Screw		1

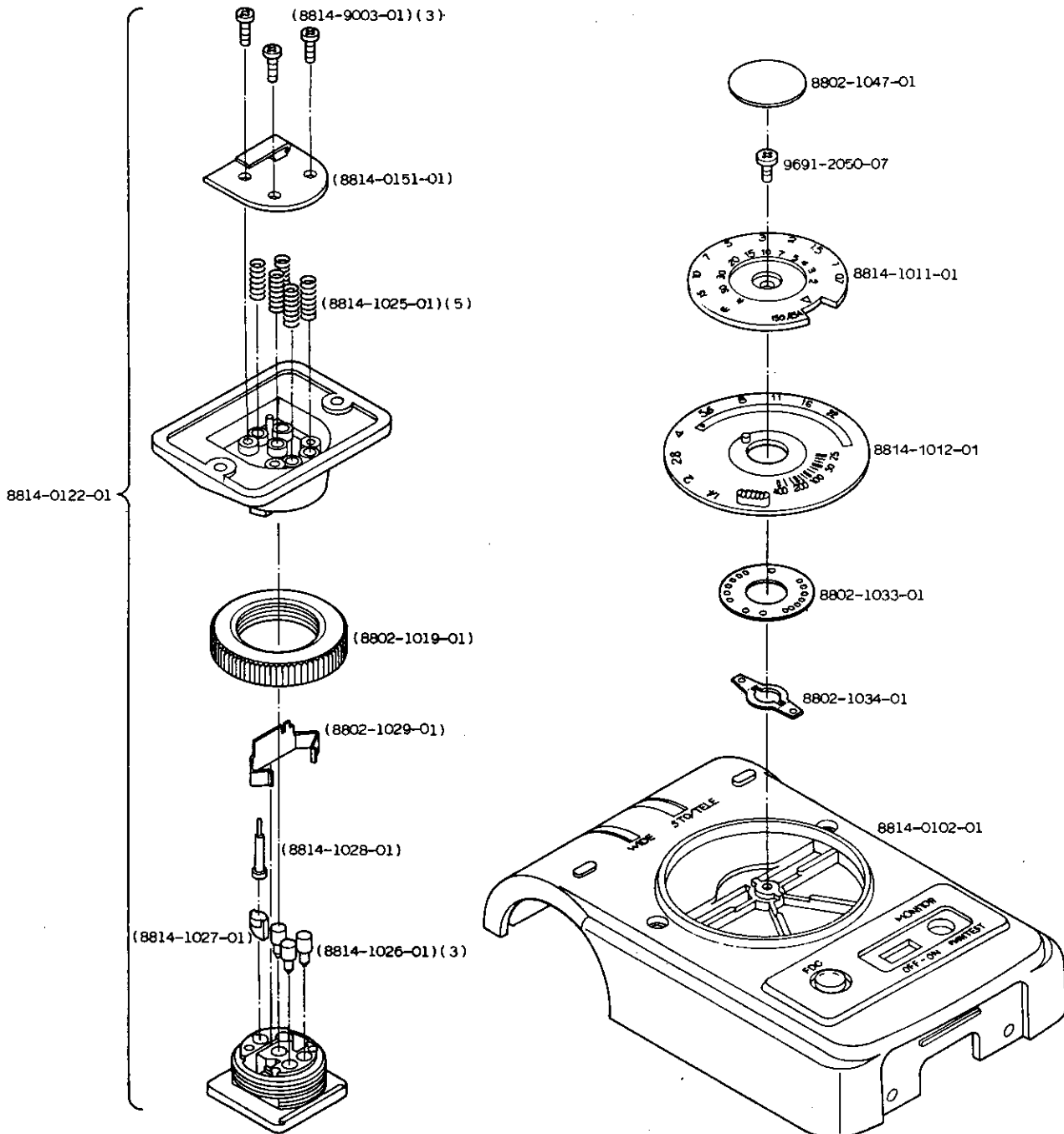
Part No.	Part Name		Qty
8814-0145-01	Main condenser	メインコンデンサー (800 μ F/350V)	1
(9361-2091-01)	Diode	ダイオード (D15)	1
8802-1003-01	Flash cover A	頭部ケースA	1
8802-1004-01	Flash cover B	頭部側板B	1
8802-1005-01	Flash cover C	頭部側板C	1
8802-1006-01	Front panel	前面パネル	1
8802-1013-01	Flash cover D	頭部ケースD	1
8802-1016-01	Reflector	反射傘	1
8802-1024-01	Reflector plate	反射傘前飾板	1
8802-1028-01	Back metal	バックメタル	1
8658-1033-01	Xe tube bush	キセノン ブッシング	2
8802-1035-01	Click spring stopper	クリックSP止め	1
8814-1042-01	Sleeve	圧着スリーブ	1
8802-1045-01	Click spring	クリックSP	1
8802-1046-01	Click claw	バウンスクリック爪	1
8802-9001-01	Screw	止めねじ	2
9351-6084-04	Xenon tube	キセノンチューブ (XE1)	1
9384-2931-01	Tube (per meter)	収縮チューブ (Tu3)	1
9384-2941-01	Thermal shrinkage tube (per meter)	収縮チューブ	2

AUTO ELECTROFLASH 132PX**CODE No. 8814**

Part No.	Part Name		Qty
8814-0102-01	Case B set	本体ケースBセット	1
8814-0122-01	Shoe set	シューセット	1
(8814-0151-01)	E board set	プリント基板Eセット	1
(8802-1019-01)	Shoe nut	シューナット	1
(8814-1025-01)	Shoe contact spring	シュー接点SP	5
(8814-1026-01)	Sync contact	シュー接点	3
(8814-1027-01)	Shoe switch lever	シュースイッチ突子	1
(8814-1028-01)	Shoe switch pin	シュースイッチピン	1
(8802-1029-01)	Shoe spring	シューSP	1
(8814-9003-01)	Screw	止めねじ	3
8814-1011-01	Distance scale dial	計算ダイヤルA	1
8814-1012-01	Computer dial	計算ダイヤルB	1
8802-1033-01	Dial click plate	ダイヤルクリック板	1
8802-1034-01	Dial spring	ダイヤルSP	1
8802-1047-01	Dial pressure	ダイヤル押え板	1
9691-2050-07	Phillips type tapping screw	十字穴付なべ頭タッピングねじ	1

AUTO ELECTROFLASH 132PX

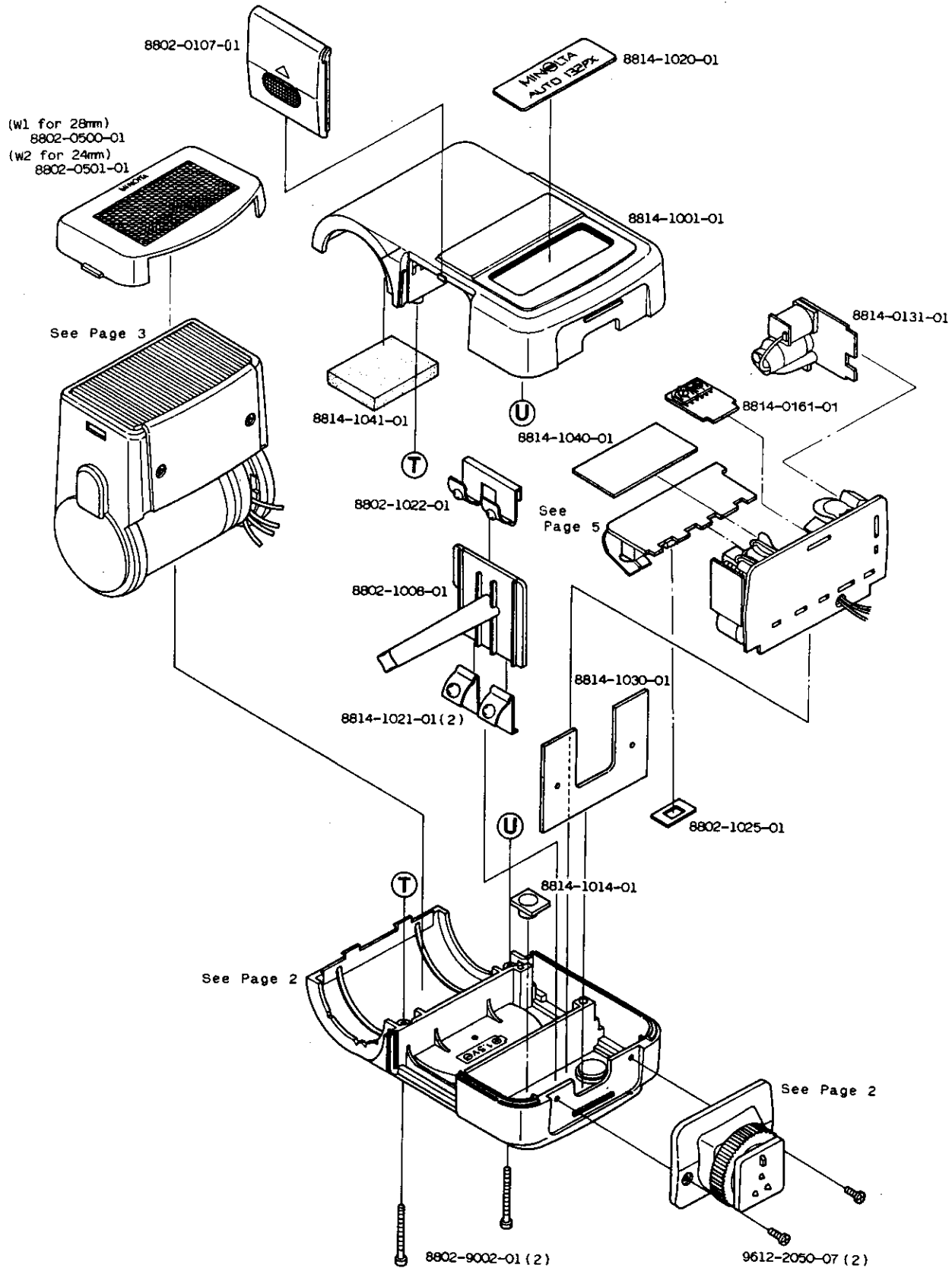
CODE No. 8814



Part No.	Part Name		Qty
8802-0107-01	Battery cover set	電池蓋セット	1
8814-0131-01	C board set	プリント基板Cセット	1
8814-0161-01	F board set	プリント基板Fセット	1
8802-0500-01	Wide panel W1 (for 28mm)	ワイドパネルW1 28mm用	1
8802-0501-01	Wide panel W2 (for 24mm)	ワイドパネルW2 24mm用	1
8814-1001-01	Case A	本体ケースA	1
8802-1008-01	Battery contact plate	電池セパレーター	1
8814-1014-01	Test button	単発釐	1
8814-1020-01	Name plate	前銘板	1
8802-1021-01	Battery contact A	電池接片	2
8802-1022-01	Battery contact B	電池共通接片	1
8802-1025-01	ON/OFF switch cover	スイッチスパーサー	1
8814-1030-01	Shoe set plate	シュー止め板	1
8814-1040-01	Isolation sheet	絶縁シート	1
8814-1041-01	Sponge	モルトブレーション	1
8802-9002-01	Screw	止めねじ	2
9612-2050-07	Phillips type screw	十字穴付なべ頭小ねじ	2

AUTO ELECTROFLASH 132PX

CODE No. 8814



I N D E X

Part No.	Page	Part No.	Page
9422-4706-81-----4		9563-1045-86-----4	
9422-4716-81-----4		9563-4735-86-----4,5	
9422-5644-81-----4		9565-3325-86-----4	
9422-8216-81-----5		9565-4725-86-----4	
9423-1036-81-----4		9595-1023-81-----4	
9423-1526-81-----4		9595-6835-81-----4	
9423-1536-81-----4		9597-2234-81-----4	
9423-1556-81-----5		9597-4733-84-----4,5	
9423-2226-81-----4		9597-6824-81-----4	
9423-2236-81-----4			
9423-3356-81-----4			
9423-6846-81-----4			
9433-9146-83-----4			
Condenser			
9511-1075-81-----5			
9511-3375-81-----4			
9512-1076-85-----4			
9534-1055-83-----4			

I N D E X

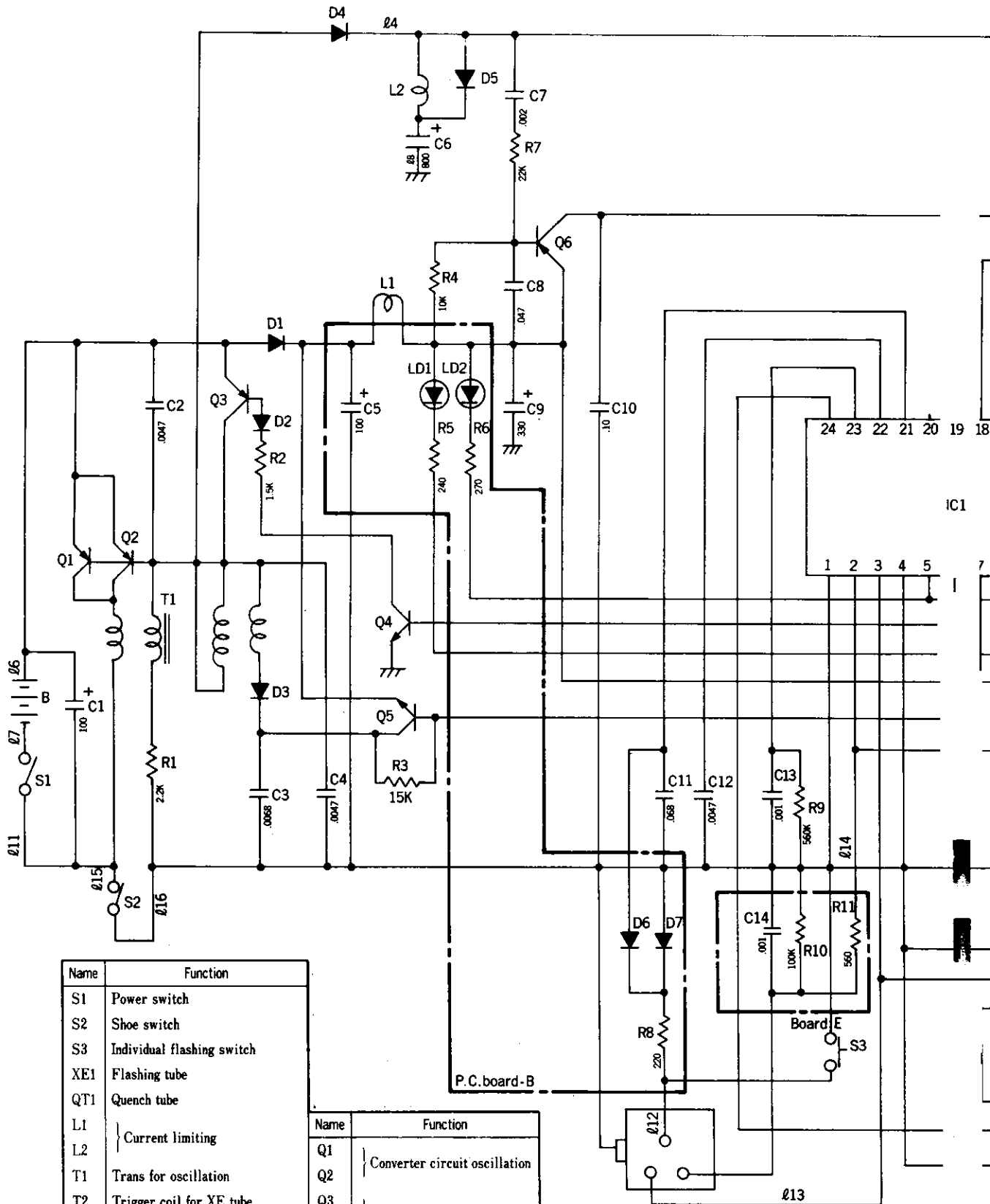
Part No.	Page	Part No.	Page	Part No.	Page
Coil		Transistor		Lead wire	
9324-5085-01-----4		9362-1082-01-----4		9393-2401-02-----6	
		9362-2082-01-----4		9393-2401-09-----6	
Switch		9363-1081-04-----4		9393-2608-02-----6	
9333-2081-03-----5		9363-1082-01-----4		9393-2608-04-----6	
				9393-2608-05-----6	
Xe tube		SCR		9393-2608-09-----6	
9351-6084-04-----3		9365-1082-01-----4,5		9393-2808-01-----6	
				9393-2808-02-----6	
LED		IC		9393-2808-03-----6	
9353-2082-03-----5		9360-0080-04-----4		9393-2808-04-----6	
9353-2082-04-----5		9366-5085-01-----4		9393-2808-05-----6	
				9393-2808-06-----6	
Diode		Tube			
9361-2080-01-----5		9384-2905-01-----4		Fixed resistor	
9361-2080-09-----4		9384-2931-01-----3		9422-1016-81-----5	
9361-2084-04-----4		9384-2941-01-----3		9422-1036-81-----4	
9361-2091-01----3,4,5				9422-2216-81-----5	
9361-4081-04-----4				9422-2416-81-----5	
				9422-2716-81-----5	

I N D E X

Part No.	Page	Part No.	Page	Part No.	Page
8814-0102-----	2	8802-1013-----	3	8814-1040-----	1
8802-0107-----	1	8814-1014-----	1	8814-1041-----	1
8814-0111-----	4	8802-1016-----	3	8814-1042-----	3
8814-0121-----	5	8802-1019-----	2	8802-1045-----	3
8814-0122-----	2	8814-1020-----	1	8802-1046-----	3
8814-0131-----	1	8802-1021-----	1	8802-1047-----	2
8814-0141-----	5	8802-1022-----	1		
8814-0145-----	3	8802-1024-----	3	8802-9001-----	3
8814-0151-----	2	8802-1025-----	1	8802-9002-----	1
8814-0161-----	1	8814-1025-----	2	8814-9003-----	2
8802-0500-----	1	8814-1026-----	2	8814-9004-----	4
8802-0501-----	1	8814-1027-----	2		
		8802-1028-----	3	Screw	
8814-1001-----	1	8814-1028-----	2	9612-2050-07-----	1
8802-1003-----	3	8802-1029-----	2	9691-2050-07-----	2
8802-1004-----	3	8814-1030-----	1		
8802-1005-----	3	8658-1033-----	3		
8802-1006-----	3	8802-1033-----	2	Transformer	
8802-1008-----	1	8802-1034-----	2	9324-1081-09-----	4
8814-1011-----	2	8802-1035-----	3	9324-2081-01-----	5
8814-1012-----	2	8814-1037-----	5		

■ Circuit Diagram **(8814)**

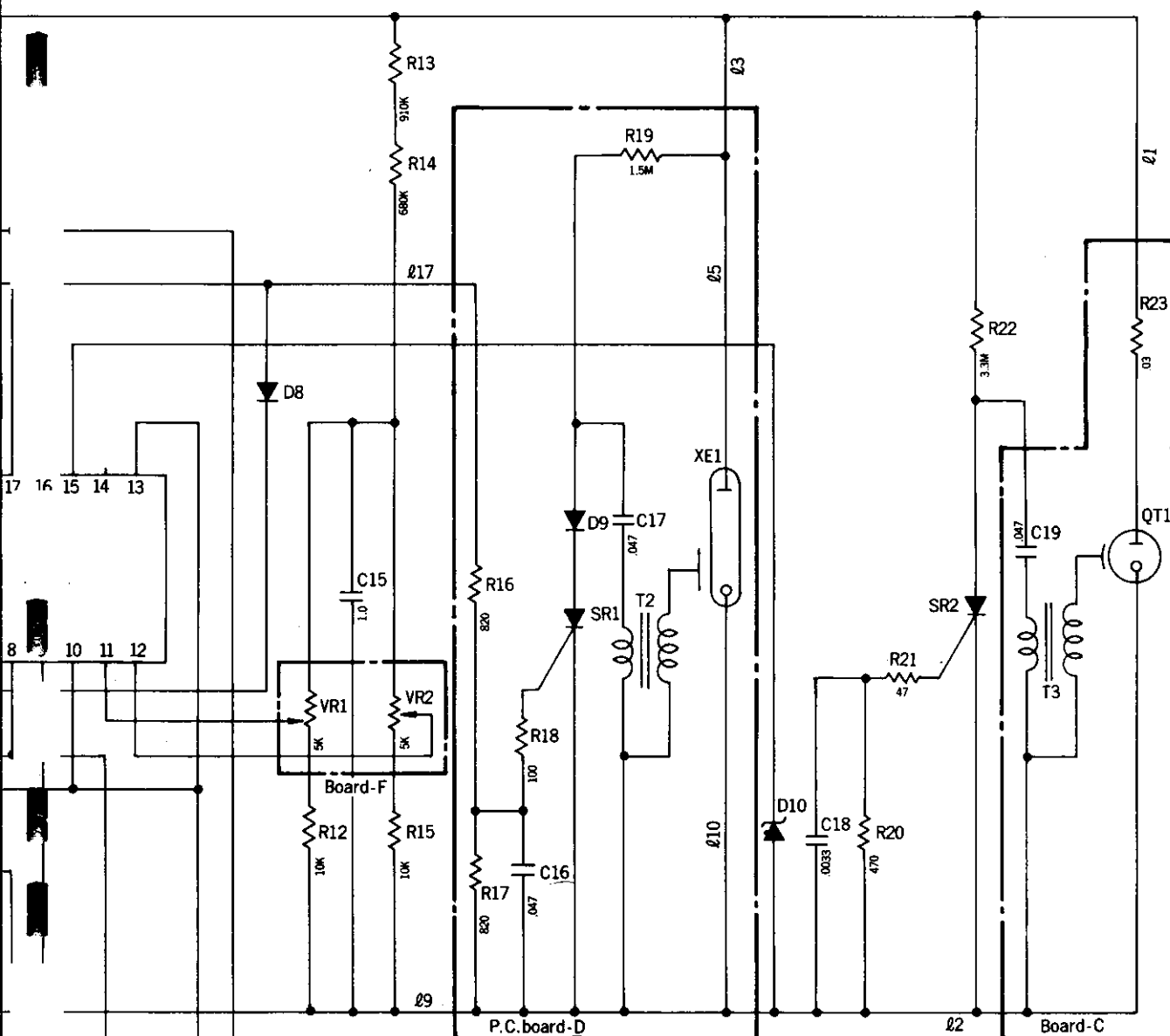
- Unit of condenser capacity is μF .
- コンデンサーの容量は μF の単位です。



Name	Function
S1	Power switch
S2	Shoe switch
S3	Individual flashing switch
XE1	Flashing tube
QT1	Quench tube
L1	Current limiting
L2	
T1	Trans for oscillation
T2	Trigger coil for XE tube
T3	Trigger coil for QT1 tube
IC1	Camera, Flash control
IC2	Output signal convertor
SR1	XE tube flashing
SR2	Firing quench tube

Name	Function
Q1	Converter circuit oscillation
Q2	
Q3	Control for Q1/Q2
Q4	
Q5	Power backup
Q6	Firing monitor
LD1	FDC lamp
LD2	Monitor lamp

Name	Function	Name	Function
D1	IC current limitation	D4	High voltage rectification
D2	Counter-flow prevention	D5	
D3	Power smoothing	D6	For synchro circuit



Name	Function	Name	Function	Name	Function
VR1	For monitor lamp lighting voltage adjustment	R15	Voltage division	C6	Main capacitor
VR2	For monitor circuit voltage adjustment	R16	SR1 control	C7	Q6 control
R1	Bias (for Q1/Q2)	R17		C8	Stabilization
R2	Q3 control	R18	SR2 control	C9	Noise absorption
R3	Q5 control	R19		C10	(power source)
R4	Q6 control	R20	For trigger circuit charging	C11	Noise absorption
R5	LD current limiting	R21		C12	For chattering absorption
R6		R22	For current control	C13	For IC oscillation
R7	Q6 control	R23	For stabilization of battery voltage	C14	Noise absorption
R8	Current limiting	C1	Bias (for Q1/Q2)	C15	Stabilization
R9	For IC oscillation	C2	Q5 control	C16	
R10	IC control	C3	Bias (for Q1/Q2)	C17	Trigger for XE1 tube
R11		C4	Noise absorption (power source)	C18	Stabilization
R12	Voltage division	C5		C19	Trigger for QT1 tube
R13					
R14					

Function

C protection

Prevention against misoperation

Counter-flow prevention

C protection

